

Sportsman Pilot™



Winter



1983



Sportsman Pilot



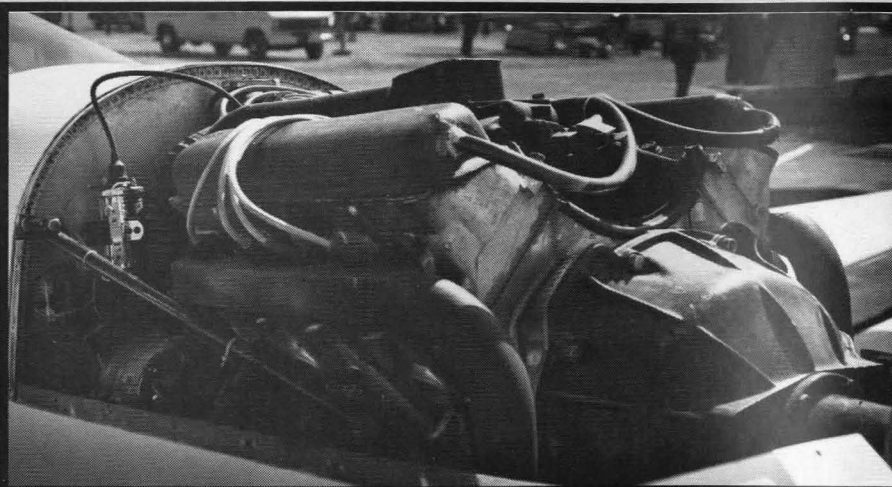
VOLUME 2

WINTER 1983

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MAG CHECK

This issue marks the completion of our second year of operation. Golda and I are grateful to all of you who have been sticking with us, subscribers and advertisers alike, as we've worked to put SPORTSMAN PILOT on a solid footing. In retrospect, we couldn't have chosen a worse time to start a new business, given the very bad state of the economy during the past couple of years, but we've managed to hang in there. Subscriptions have continued to increase from day one, and with them have come some economies of scale that we can pass along to each of you. Once again, we are going to hold the line on our subscription price. It will still be just \$7.50 per year in the U.S. and \$8.50 elsewhere for 1983.

We get a lot of orders for back issues from our new subscribers. For everyone's information, this is the back issue situation: Volume 1, Number 1 sold out before we could get our second issue published. Consequently, we increased our orders for subsequent issues and the remaining 7 numbers are still in stock . . . however, the number two and three issues of 1981 are all but gone. We are still maintaining a file of names of those of you wanting Volume 1, Number 1, but don't have a sufficient number as yet to justify reprinting it.

We send out back issues in an envelope via First Class mail, so we have to charge \$2.00 each for them. If you live outside the U.S., write us for the price to your nation.

We continue to be heartened by your favorable comments on SPORTSMAN PILOT . . . and will strive to make it even better in the year ahead.

Hope to see a lot of you at fly-ins this year.

KALEIDOSCOPE



PIPER CUB COUPE... CONTINUED

Somewhat to our surprise, the retrospective piece we ran last time on the Piper Cub Coupe evoked quite a response from our readership. It seems a lot of you have fond memories of the airplane... but fondest of all are those of the nattily dressed young man you see above, returning your glance through the time warp of photography from an August day in 1940. He and his Cub Coupe are posing for the camera on the ramp at the Portsmouth, NH airport, to which he had flown from New Jersey to court a young lady named Rosamond Ellis.

Do any of you recognize him?

Well, friends, our debonair young sportsman pilot is none other than EAA's Washington Representative, David Scott!

David learned to fly in 1935 during his senior year at Princeton. He started out in a Fairchild 22 but switched to a Kinner Bird just prior to his solo. He bought his first airplane, an Aeronca C-3, in 1938 and flew it for 100 hours before buying the Cub Coupe pictured here. It's a J-4 with an overhead exhaust Continental A-65 — before the advent of the pressure cowl. It was regretfully sold with the coming of World War II.

In 1947, David bought an Ercoupe 415C and flew it until September of 1949. In 1956 he and his brother bought a new Cessna 172, which they flew until David moved to Washington in 1958.

But back to the Cub Coupe. David recalls the flight to New Hampshire as the most memorable of his aviation experience. Fretting over a week's delay due to poor weather, he threw caution to the wind and took off from Hadley Field near Plainfield, NJ, heading out over NYC. Low ceilings threatened to turn him back all the way across Long Island and the Sound, eventually pushing him down to 300 feet on the Rhode Island coast. He broke out just before reaching Providence, however, and had CAVU condi-

tions the rest of the way.

Was it worth the risk? You bet... the following March he and Miss Ellis were married and have lived happily ever after.

MATTY LAIRD

Matty Laird, who with his wife, Elsie, was so much a part of the last issue of **Sportsman Pilot**, died December 18 at Boca Raton, Florida. He was 86.

Matty's best known accomplishments were the design and building of the Solution, winner of the 1930 Thompson Trophy race, and the Super Solution, winner of the 1931 Bendix. What is difficult for us to comprehend today, however, is that by the time he built the Solution, Matty was already a legendary figure in aviation circles. He was just 34 years old in 1930 but had already been designing and building airplanes for 17 years! An aviation pioneer in the truest sense of the term, he was born in 1896; was 7 when the Wrights flew in 1903; was 14 when he saw his first airplane — Walter Brookins flying a Wright Model B over Chicago; taught himself to fly in his personally designed and built monoplane in 1913; was only the fifth American to loop an airplane — in 1916 — and is said to have been the first to loop with a passenger (Marjorie Stinson); had built his 3rd airplane by the time he was 20; designed and built the first commercially successful lightplane following World War I — the Swallow. He built 43 Swallows in Wichita between 1920 and 1923 when he sold out and returned to Chicago to begin producing his famous series of Laird Commercials, the "Thoroughbreds of the Air".

Matty continued to manufacture airplanes until the late 1930s. During World War II, he was a successful sub-contractor for the military and had a new lightplane design ready to put into production following VJ Day. Matty, however, was one of the few in aviation who anticipated the big bust that occurred in 1947-

48 and got out of the business in time.

In his later years, he was much sought after by aviation historians and sport aviation enthusiasts. He always was one of the most approachable of the aviation greats, and was so modest and unassuming that sometimes it was hard to realize that here was a man who had accomplished so much. Undiminished in his mental capacity right through his last day of life, Emil Matthew "Matty" Laird was a living treasure trove of information on aviation history, nearly all of which he had personally experienced. Beloved by all who knew him, Matty will be missed by each of us... but it is a sadness tempered by the knowledge that the accomplishments of his long and productive life will live as long as mankind pursues its dream of flight.

NEW MONNETT MODELS

John Monnett has been making good use of the harsh Wisconsin winter. He and his shop crew have been hard at work building tri-geared versions of both the Sonerai II and the MONI. The original configurations will continue to be available — the tri-geared versions are simply a broadening of his product line to suit the needs of the widest possible spectrum of pilots. The tri-gears will be retrofittable to existing Sonerai's and Monis.

The two-cycle KFM 107 powered MONI has been refitted with the two cylinder, four-cycle KFM 105. With 40 horses on tap, this version of the MONI should be a dynamite little sportplane.

At the rate John's going, it will take a full row at Oshkosh just to display all his different models!

QUICKIE NEWS

In order to more safely accommodate the Continental O-200s builders are beginning to stuff into Q2s, Quickie Aircraft has developed a new canard that employs a higher lift airfoil.

The new airfoil, which is thinner than the present Glasgow University (GU) section, has been found to be less prone to performance degradation and consequent trim change when flown in rain or with a heavy load of bugs. Stall/spin and flutter testing remained to be accomplished at the end of 1982, but all other flight test results had been positive . . . including the capability of carrying a CG three inches further forward than with the old GU airfoil.

The single place Quickie is also undergoing development. A 2-cylinder, 4-cycle Citroen engine is being installed on the prototype N77Q. With as much as 30 hp available, performance should be greatly enhanced.

The new canard airfoil being tested for the Q2 will also be tried on the Quickie. Significantly, the new canards will be retrofittable to existing Q2s and Quickies.

Garry LeGare of Leg Air Aviation has been flying his personal Q2 for about a year or so with a sort of T-tail arrangement which is successful not only in overcoming the loss of trim in rain, but also allows him to trim in level flight to gain 5 or 6 mph over what was possible before the vertical fin mounted trim tab was installed.

FEUDIN' FUELERS

There's a feud abrewin' in the world of corporate flying that may ultimately affect us sportsman pilots. When avgas and jet fuel crashed the two buck barrier, many corporate flight departments started their own fuel farms to take advantage of the discounts available for bulk buying. This, of course, cuts FBOs to the quick because corporate aircraft have always been their best fuel customers. What's left of their business, the private owners, are flying less because of high costs, so the FBOs are really being squeezed. Despite this, some are turning a cold shoulder toward the new market that's been created for them by EAA's auto fuel STC for the Cessna 150. The enterprising operators are putting in auto fuel and are selling it like crazy, but others, long accustomed to the easy profits of a ramp full of King Airs and Lear Jets, are having trouble adjusting to the new world facing them. EAA's already working toward an STC to burn auto fuel in pre-1978 Cessna 182s and it's just a matter of time until most of the piston engine fleet will be approved for auto fuel . . . so a bunch of people are going to have to change their thinking or the most common sight on their ramps will be gas cans and chamois.

AEROBATIC RALLY

Aerobatic ultralights are the hot item these days among the most competitive companies. The newest one we've heard about is Rotec's aerobatic Rally. Bill Adaska tells us it does flip-flops with the greatest of ease . . . including extended inverted flight! You're certain to see this machine at Sun 'N Fun next month.

SOLITAIRE PLANS

Mike Mellvill tells us plans for Burt Rutan's Solitaire should be available by mid-March. The KFM 107 engine will be the recom-

mended powerplant and its installation will be shown in the drawings.

ANOTHER LAIRD

When Matty Laird closed down his production line in the late 30s, an almost complete LC-RW300 was left sitting there minus engine and fabric. It was eventually sold, but was never completed. At some point along the way it was sold to noted antiquer Joe Erale of Brentwood, NY. Still later, it was purchased by Jim Rollison of Vacaville, CA, a Cessna Airmaster owner (C-145, NC19462, Ser. 414). Jim is one of your fellow subscribers to SPORTSMAN PILOT, so after he read the article on the Honeymoon Laird in the last issue, he contacted and later visited Forrest Lovley. The happy result? Forrest will complete the LC-RW300!

The LC-RW300 is a real rompin', stompin' powerhouse of a biplane. Powered by a Pratt & Whitney R-985, rated in those days at 300 hp, it would cruise at 150 mph and had a rate of climb of 1500 fpm. Today, the R-985 cranks out 450 hp, so it should **really** perform! Forrest once asked Matty which of his many designs was his favorite, to which he replied, "The big engined jobs." Meaning, of course, the LC-RW300 — one of which was fitted with a R-1340! "You could pull out onto the runway and just punch it," Matty said.

"Punch it and you'd be going round and round," said Forrest.

"Yes, but you'd be up a 100 feet before you got half way round!" was Matty's rejoinder.

Forrest, incidentally, is currently finishing up a Waco RNF, NC101Y, for a customer, and has been building ribs for his own Cessna DC-6, NC9864.

COVERT CRICKET

Chris Heintz has been doing a brisk business in Crickets (nee Cri Cri) despite the tailspinning economy, which, obviously, is a classic case of having the right product for the times. Red Morris, the genial company test pilot, has been all over the place this past summer and fall demonstrating the tiny twin. He was flying at Oshkosh, Marion, OH (MERFI) and Kerrville, TX.

The Zenair Cricket prototype may never be seen by us sportsman pilots again. Last fall, at the conclusion of the fly-in season, it was dropped off at a major avionics manufacturer's plant for installation of an autopilot and various and sundry other black boxes. The mini-multi is, you see, going to be given a tryout as a radio controlled drone. A second Cricket, minus its cockpit and canopy, will also be a part of the evaluation.

And Zenair is involved in still another project with military overtones. The company is entering a South American military trainer competition with a hybrid machine consisting of a Tri-Z fuselage and Zenith wings, powered by a 180 hp Lycoming.

SPORTSMAN PILOT hopes Zenair wins big in both trials and ends up with fat contracts in each instance . . . so there will be lots of money to develop more sportplanes!

EXHAUST SYSTEM ADVISORY CIRCULAR

Exhaust systems are about the most failure

prone parts of lightplanes . . . a fact that has prompted a recent FAA Advisory Circular. AC 91-59 notes the most common failure points and recommends the preventive maintenance procedures to avoid them. A copy is available from the DOT, Publications, M-443.1, Washington, DC 20590.

BARRACUDA KITS

Aircraft Spruce and Specialty has become the exclusive distributor of materials kits for the Barracuda. Plans are available from Bueth Enterprises, P.O. Box 2401, Laguna Hills, CA 92653. For materials kits, contact Aircraft Spruce and Specialty Co., P.O. Box 424, Fullerton, CA 92632. Phone 714/870-7551.

COMET ON HOLD

Last time we had a commentary on the restoration of the deHavilland D.H. 88 Comet, Grosvenor House, by its current owner, the Shuttleworth Trust in England. The goal was to have the racer airworthy in time to fly it to Australia to commemorate the 50th anniversary of its victory in the 1934 MacRobertson England to Australia race. We're sad to report that the Shuttleworth's trustees have halted the restoration work until "appropriate financial backing can be obtained".

SO LONG, "DC"

For 50 consecutive years we've had Douglas Commercials . . . "DC" for short. Now, like Pratt & Whitney's old eagle logo and so many other icons of aviation's glorious youth, DC slips into the pages of history. McDonnell Douglas chairman Sanford McDonnell says that, henceforth, his company's airliners will carry the prefix MD rather than the old DC. The DC-10, thus, will be the last in a line that began with the DC-1, gained immortality with the DC-3 and went on to see more than 15,000 DC models delivered — a total said to be greater than the output of all other transport builders combined.

SAN DIEGO RACES

A program of air racing was included in last fall's EAA fly-in at Brown Field in San Diego. Of special interest was the fact that a couple of Racing Biplanes were allowed to race with Formula Ones — or IMFs as they are known on the West Coast. The IMFs are powered with what is basically a Continental O-200 and the Racing Biplanes start out with Lycoming O-320s. All of them are modified to the extent the rules allow (or whatever can be sneaked by technical inspectors). There has always been a lot of speculation about the Racing Bipe's ability to run with the midgets . . . so race officials decided to find out. Pat Hines, the Racing Biplane winner at Reno '82 in Sundancer, and Tom Aberle in his "Two Bits" were matched against midgets more or less in their speed range — Aberle in the slower class and Hines with the hot dogs. In Heat One, Aberle finished 5th in a field of 7 and improved to 3rd in the Silver final. His best speed was 206.453 for 8 laps. Hines finished 3rd out of 5 in Heat Two at 222.121 for 6 laps. In the Gold final he cut a

Garry LeGare has . . .

developed a new all composite amphibian named the Sea Hawk. Powered by an O-235 Lycoming, it has been flying since late summer of 1982, but at year's end was just getting around to its first operations off water. Garry had to move heaven and earth to get the state of California to let him use Lake Isabella, the nearest suitable lake from Mojave.

The Sea Hawk will be marketed as a pre-molded kit and can be powered with as much as 160 hp. Garry expects to have the number two Sea Hawk at Oshkosh with a Lyc. O-320 and a CS prop. Should be a goer! For the Sea Hawk info pack, send \$8.00 to Aero Gare, Bldg. 105, Mojave Airport, Mojave, CA 93501. Phone 805 824-2041.



SEA HAWK

number of pylons and was relegated to last place. Both had proven they were competitive, however.

Top dog at San Diego was Phil Fogg and his #1 "Aloha". He blew everyone away in Heat One, flying 6 laps at 247.850 . . . just over 10 mph faster than second place finisher, Ray Cote. Fogg coasted to an easy win in the Gold final, with Cote again second. Reno IMF winner, Jon Sharp, was third.

SUN'N FUN LAKELAND, FL MARCH 13-19

AN ANCIENT JOKE

Years ago, we printed this little aviation oriented joke in a newsletter we published:

A pilot in the first transcontinental air race had to make a forced landing in a rural area where no airplane had been seen before.

With his goggles over his eyes and a long white scarf streaming out behind him, he guided his biplane to a safe landing in a watermelon patch . . . where it just so happened that a wrinkled old hired hand was helping himself to one of his employer's melons.

The old man, his eyes and mouth wide open, watched the strange craft from the sky bounce to a halt in the field, and stood speechless as the young pilot climbed from the plane and strode straight toward him.

Before the pilot could say a word, the frightened old man tipped his hat, smiled meekly and said:

"Mornin', Mister Jesus, how's your Pa?"

GEE BEE IN SAN DIEGO MUSEUM

Bill Turner's Gee Bee Z is currently on display in the San Diego Aerospace Museum, and in February 1984 goes to the National Air and Space Museum in Washington for a 3 year stay. It will be the centerpiece of a planned Golden Age of Aviation exhibit, according to Bill.

Meanwhile, Bill is forging ahead on his project to build a full scale replica of the deHavilland D.H. 88 Comet racer and fly it from England to Australia to commemorate the 1934 MacRobertson race. With completion of the Shuttleworth Trust's Grosvenor House now in doubt, Bill's replica could well be the only Comet available to make the commemorative flight. He is looking for a sponsor (or sponsors). If any of you are interested in some worldwide publicity for your company and/or product, contact Bill through his agency for the project: Communication Resources, 10708 Janesville Rd., Suite 330, Hales Corners, WI 53130. Phone 414/529-3420.

ROTORWAY GOES HI-TECH

B. J. Schramm is rapidly moving RotorWay into the realm of hi-tech by installing all sorts of new numerical controlled (NC) equipment — computer driven, of course. He has also reorganized his management team, taking on a general manager, NC supervisor and a production manager. A training program is in place to instruct employees to use the computers to run the NC equipment.

The obvious question is what B.J. intends to do with the greatly expanded production capacity he will soon have in place. Of an immediate nature, RotorWay has at long last won approval for its homebuilt helicopter kits in Canada and a pent up demand there is expected to absorb nearly a year's production. Afterwards? Well, there are intriguing things afoot at the RotorWay works, but all of us are just going to have to wait to see which one of them surfaces first.

At Eloy, B.J. took me for a ride in an Exec so I could get some of the aerial shots of the Copperstate Fly-In you see in this issue. The

Exec is an impressive little machine and B.J. is obviously its complete master. It's a heck of a thrill to go zipping across the desert just above the scrub — and it's easy to understand how folks get hooked on these things.

CAROLINA COUPE TO MCCULLOCH

Doug Creech of Pineville (Charlotte), NC has sold his D-145 Monocoupe, the famed Carolina Coupe, to John McCulloch, who recently moved to Naples, Florida. John was fresh out of Monocoupes after donating his legendary Clipwing "Little Butch" to the National Air and Space Museum earlier in the year. Last May Doug experienced an engine failure shortly after take-off for the Carolinas-Virginia EAA Antique Chapter fly-in in Statesville, NC. Luckily, he was able to get the Coupe back to his private strip but had only enough altitude to come straight in . . . downwind. He had to nail it on to get stopped and suffered some damage to the gear, lower fuselage and a wing. Doug walked away from it, so his decision and efforts must be labeled a complete success. Airplanes can be fixed . . . always remember that.

Anyway, John will get the Carolina Coupe rebuilt and, he tells me, will retain the stunning black with white trim paint scheme. (Good!)

After donating Little Butch to the NASM, John claimed he was through with little airplanes — was just gonna finish out his time with Eastern, then retire to the ol' golf course. That's what they all say, these Monocoupe addicts, but sooner or later they all come to realize their disease is INCURABLE!

And speaking of Monocoupes, Gar Williams (of Grand Champion Cessna AW fame) currently has a couple in his restoration shop. He found he would have to rebuild a wing on one of them, so has decided to build hard tooling to do it so that he can more easily reproduce the standard 'Coupe wing. Gar is, of course, a superb craftsman, so if any of you are in need of a new Monocoupe wing, contact: Gar Williams, AERO CRAFT, 9S135 Aero Dr., Naperville, IL 60540, phone 312/355-9416.

RSA FLY-IN

Our friend Harold Best-Devereux was unable, due to business considerations, to attend Oshkosh last summer, but as a nice consolation, flew his Tailwind from his home in Herts, England to Brienne, France for the RSA fly-in. France has always been a hotbed of homebuilt activity and their national fly-in always features a variety of unusual aircraft. Harold has sent along the pictures you see here — homebuilts not yet seen in the U.S.

Harold, incidentally, is researching what will be the most amazing story the world of homebuilt aircraft ever spawned — the life and times of Henri Mignet, the creator of the controversial Flying Flea. He will write a book . . . and rest assured it will be reviewed for all of you on these pages.

(Copyright photos by Harold Best-Devereux)

Tsilefski TG. 01



Jean Grinwald's G 801 Orion, the "poor man's Learfan".

The Poussin (Chick) designed by Albert Gatard. VW powered, it uses wing flaps and ailerons for pitch control. The slab tailplane is for damping.

Pottier P170S two-place with 19' 6" span and VW power. All metal, pop riveted. Weighs 990 lbs.



ELOY '82



If you want to be formal about it, it was the 11th Annual Copperstate Fly-In sponsored by the 13 EAA and IAC Chapters that make up the Arizona Council of EAA Chapters. But if all that is too much of a mouthful, just say "Eloy" 'cause that's what this fly-in is going to be called in the years ahead. People like short names.

The fly-in was moved last year from its old site at Marana, AZ up the road apiece to Eloy. Marana has long been a parking lot for used, abused and bought-but-not-paid-for airliners, and with the current worldwide economic situation, it's been getting increasingly crowded of late. Eloy, on the other hand, was not crowded, it had an FBO, an airport manager, mayor and city council who wanted the fly-in and were willing to work hard to get it there — so they got it. The Arizona Council is not populated by fools . . . these days, if you run across a town that values its airport and welcomes a fly-in, you

jump right in and cultivate those fine, progressive people.

A key figure was the FBO, Rex Taylor. Proprietor of HAPI Engines and, just recently of Viking Aircraft, which markets the Dragonfly, Rex has been going all out to make Eloy the home base of all the various forms of sport aviation in Arizona. A couple of rotorcraft fly-ins have already been held, a FAA approved aerobatic box has been established close by for the Phoenix Aerobatic Club (IAC Chapter 69) and negotiations are underway to get other sport aviation related businesses to move onto the airport. Bernie Warnke, for instance, is close to moving his propeller business in — right next to Rex.

Early last year Rex and the city fathers presented the Council with a package of incentives that would have been hard to turn down. They would pave a large ramp for showplane parking; would carve a com-

pletely new, two runway mini airport out of the desert scrub exclusively for ultralights; would host a big western bar-b-cue for all comers on Saturday night and, in general, would work with the Council in every way to make the fly-in a success.

Refreshing, eh?

The Council ultimately agreed on Eloy as their new fly-in site and the weekend of October 15-17 was chosen as the date. Dame Fortune was smiling from the outset, because it would be a picture perfect weekend, not just at Eloy but over the entire western 2/3s of the U.S. As a result, people and airplanes came from everywhere and the fly-in was a resounding success.

There was a lot of flying at Eloy — a lot of rides given, a lot of fly-bys, just a lot of low keyed fun for everyone. I had the opportunity to fly with B. J. Schramm in an Exec, both Mike Melvill and Dick Rutan in their respective Long-EZs, with Rex Taylor in the

Mike and Sally Melvill's Long-EZ.



Larry Wohler's Falco — the first homebuilt version to fly. Larry is from Tucson.



Sally and Mike Melvill

Dragonfly and as you will read elsewhere in this issue, with Ken Brock in his new T-18.

It was interesting to compare Mike's Lycoming O-235 powered Long with Dick's O-320 version. Mike's is the luxury boat of the two, having a plush interior and very comfortable seating. Both have excellent intercom systems. Dick's world record holding N169SH is an airplane anyone would be proud to own but has a rear seat that is designed to be pulled out in favor of a fuel tank that will enable him to fly around 5000 miles non-stop. It isn't as luxurious as Mike's back there, but it isn't bad. With 160 horsepower, Dick's Long-EZ naturally has a better rate of climb and a higher top speed, but it isn't as obvious as you might think. Mike's 108 hp version does very well, indeed, so that I really had to look at the airspeed to be aware of the extent of the speed differential. I flew with Mike to take aerial pictures of the

fly-in and with Dick to have him demonstrate the methods he uses to evaluate the stability and control characteristics of aircraft, but in both instances, we ended up flying their aerobatic routines. Both are very smooth pilots and the Long-EZ goes effortlessly through the positive maneuvers they string together for their show performances. It's so easy to do an aileron roll in the Long-EZ that even I managed to do a few.

I don't know if it's just me or if others feel the same way, but after you rack a VariEze or Long-EZ around for a while, particularly after steep, tight turns and stall attempts (and that's all you can achieve — attempts), you begin to experience an almost eerie sense of security. You **know** you can't stall out of a turn, so you stop trying to sense the onset of one when you pull it hard. Turns in the pattern when you are low and slow no longer have every nerve ending alert for pre-stall

buffet. It's difficult to describe, but it is a very pleasant experience . . . so much so that I can easily understand how one could become dangerously **overconfident** in either airplane.

The EZs are very good in turbulence. They bounce around like any airplane of similar wing loading, I suppose, but it's the **way** they bounce that's different. Again, it's difficult to convey the characteristics, but the canards seem to "walk" over turbulence. It's a rather strained analogy, I know, but imagine a four wheel vehicle, each wheel independently sprung, driving over a plowed field. Each wheel moves up and down, reacting to only what it encounters, while the main body of the vehicle floats along more or less level, dipping or jerking only when all four wheels hit similar furrows simultaneously. Compare that to riding an unsprung bicycle over the same terrain. The Long-EZ kinda "walks"

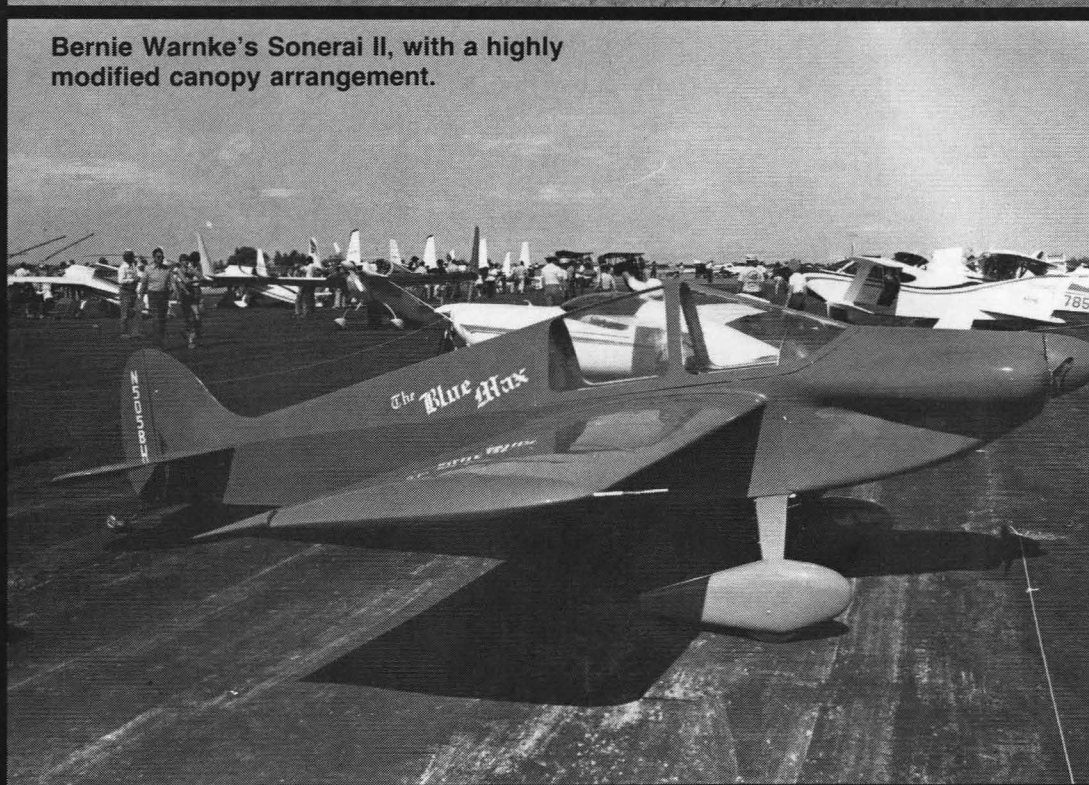
Jeana Yeager about to give Bob Hovey's Delta Bird a whirl.



The D'Alessandris JT-SP "Pony Express" at Eloy. Attempted to qualify at Reno, but was too slow.



Bernie Warnke's Sonerai II, with a highly modified canopy arrangement.



Cardboard mock-up of Stan Teleski's XP-598, the result of an ultralight design study by EAA Chapter 598.



through turbulence like that, whereas a conventional airplane is more like the bike. You can sit there watching the canard tips flex up and down, yet little of the potential bouncing gets transmitted back to you in the fuselage. It gets rough as a cob over the desert in the early afternoon and if you have to fly then, a Long-EZ would be about the best lightplane ride around.

Dick and I pulled some Gs in his Long, but the semi-supine seating apparently prevented even the onset of grayout. But try holding a camera to your eye in the bottom of a loop!

Later, Rex Taylor and I flew the Dragonfly. Bob Walters and I had been trying for some time to get together to fly his prototype, but it never worked out, so here I was flying it with its new owner — in Arizona instead of Florida. Anyway, the first impression once the canopy has been lowered is that visibility

is outstanding. You can even see straight ahead over the nose while taxiing . . . although I understand the plans-built versions sit at a little higher angle of attack, so this may not be possible in them. The second major impression comes when the aircraft begins to move. It has a little solid tailwheel attached to a tapered rod tail spring and every bit of rolling energy it absorbs is transformed into noise, which, in turn, is transmitted into the tail cone . . . and since you sit right in the open mouth of that large megaphone, you really get blasted! It's the durndest noise I ever heard in an airplane. It's really bizarre on take-off. As the airplane accelerates, the noise grows louder and louder . . . then instantly stops. The tailwheel has come off the runway. It's just the reverse on landing. There is absolutely no doubt about the instant the tailwheel is on the runway!

The prototype Dragonfly has direct tail-wheel steering and a single actuator that brakes both main gear wheels simultaneously — like a Sonerai or the early Pipers. The actuating device is somewhat unusual. It is a sort of metal blade with a knob on the end and deep notches or detents cut into it so that it can also be used as a parking brake. Mounted on the left side of the cockpit, it pulls straight back for braking — then can be dropped down into a detent to lock the brake on. This comes in handy on the prototype, because in flight the knobby main gear tires are spun up by the slipstream and begin to shake the canard if the brake isn't set. You obviously must remember to unlock the brakes before you land. I rode in the right seat and did not use the brake, but in watching Rex, it appeared to be a little awkward in operation. Although the airplane I've owned for the last 10 years also has a hand



Rex Taylor's Dragonfly



Dick Rutan mounts up as he and Mike Melvill prepare to go wring out Ken Brock's T-18. They were impressed, particularly with acceleration on take-off and its handling qualities.



First Place Antique, Woodson K. Wood's 1933 Waco UBF-2.

brake, I don't particularly like them. You can get used to them, but I'll take either heel or toe brakes every time. On the Dragonfly, Bob Walters and Rex think the hand brake is preferable, because of the ultrawide main wheel spacing. It's an advantage up to a point, but once you get it going around, you will learn a new meaning for "crack the whip". Toe brakes, they believe, would just get you into trouble.

On take-off, the little 1834cc HAPI engine pulled strongly and we were off in what seemed normal for, say, a Cherokee. Climb-out was better than I expected it would be in the desert heat and visibility ahead was still quite good. I flew the thing around for a while, mainly getting the feel of it in ever tightening turns. In them, it exhibits much the same feel as the other tandem wing or canard aircraft. I couldn't make it do anything nasty.

Generally, the Dragonfly has a very con-

ventional feel. It is well dampened in all axes and the controls are fairly well harmonized. It doesn't have an exceptional roll rate compared to many homebuilts, but it is better than most factory jobs. Again . . . I can't emphasize this too much . . . the visibility in cruise is superb.

Rex did the landing and if I have to pick at the airplane, this is where it would be. All the composite jobs I've tried are an order of magnitude cleaner than anything us garden variety spamcan pilots are accustomed to flying and, as such, they are very difficult to slow down . . . and keep nailed on the desired approach speed. The approach is very, very flat and if you aren't right on the money when you come over the threshold, it's going to **stay** flat . . . right on down the runway and into the next county! Burt Rutan ultimately had to put a belly mounted air brake on the EZs and I think the Dragonfly (and the Quic-

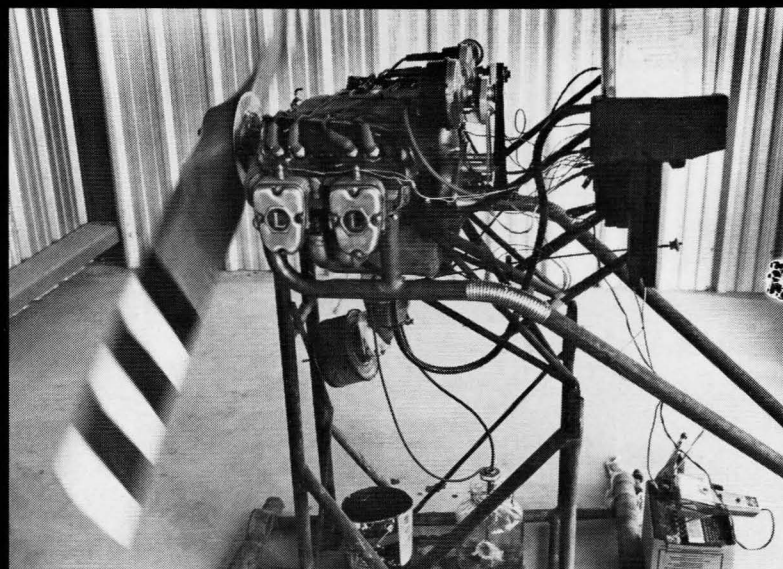
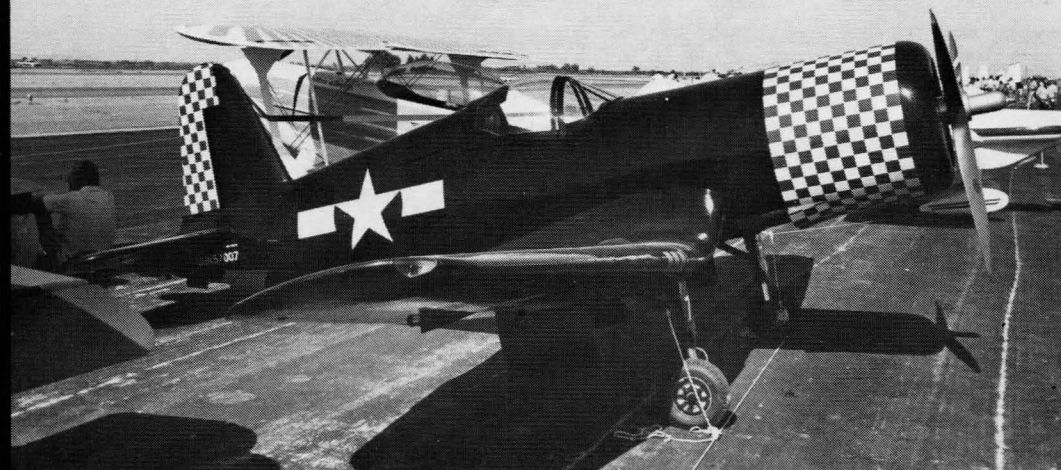
kies) need some sort of drag producer, also. Skilled pilots who fly these things regularly **can** master them, of course, but 50 hour per year weekend pilots regularly run even Cessna 150s off the far ends of 5000 foot runways. I know — I see it in the accident reports every week. The sleek new composites are the wave of the future, no doubt about it, and everyone is going to want one. It behooves us, therefore, to make them easy to use by the widest spectrum of pilots. (Note: Since writing this, Rex Taylor informs me a belly mounted airbrake is, indeed, on the way for the Dragonfly. Good show!)

Despite the nit picking, I liked the Dragonfly. It's a very stable cross country platform and, with the little VW, is very economical. A ton of them are already under construction and it's going to be around for a long time to come. To make sure of that, Rex is arranging with various suppliers to

Eloy '82 Grand Champion,
Bill Buethe's Barracuda.



Best Replica at Eloy, Bill Coffey's half
scale Corsair.



ON THE COVER



Granny Nourse brought his Lycoming O-145-B2 to Eloy and amazed everyone by running it at 120 rpm! The secret is the replacement of the mags with twin distributors (Chevy Vega)... and water vapor injection. Granny has built a Spratt Controlling.

D. J. Sweeney of Scottsdale, AZ climbs out of his W.A.R. P-47 Thunderbolt. Powered by a 150 hp Lycoming.

produce kits — including many pre-molded parts — for those who don't want to build everything. He'll also continue the personalized builder support Bob Walters provided his customers.

While I was out getting my kicks, everyone else was doing his or her best to enjoy the beautiful weekend, also. A number of forums and workshops were being held in the T-hangar area, a thriving flea market occupied many and the rest were content to simply wander among the showplanes admiring them, photographing them and talking to their owners.

Daylight ends abruptly on the desert. One minute we were out savoring some shiny winged goodie and the next it was too dark to snap a picture of it... it was time, then, to get in line for the bar-b-cue. A large new hangar was nearing completion next to HAPI Engines and it had been commandeered as

the banquet/awards program site. After some truly delicious chow, we settled back to see who would haul home the trophies this year. First, however, there was a remembrance of Mac McClure who died of cancer early last year. Mac had been the chairman of the Arizona Council for several years, as well as president of Chapter 228. He was a driving force in Arizona sport aviation activity and the success of the Copperstate Fly-In in the years ahead will be a lasting tribute to his organizational skill and dedication. Most of all, though, we'll miss him as a friend.

The major award winners were: Best Rotorcraft — Don Gray's Bensen B8M; First Place Ultralight — Bill Sadler's Vampire; Best Warbird — Woodson K. Wood's Piper L-4J; First Place Classic — Tony Terrigno's Mooney Mite; First Place Antique — Woodson K. Wood's newly restored Waco UBF-2; Best Replica — Bill Coffey's half scale Cor-

sair; Best Wood homebuilt — Bill Buethe's Barracuda; Best Tube and Fabric homebuilt — Harold Buttles' Hiperbipe; Best All Metal homebuilt — Ken Brock's T-18; Best Composite homebuilt — Rex Taylor's Dragonfly; and the Grand Champion of the 1982 Copperstate Fly-In was Bill Buethe's Barracuda, N78WB. 1982 has been quite a year for Bill. He has appeared on the cover of **Air Progress**, and during the summer, purchased the rights to the Barracuda from its designer, Geoff Siers. If you are interested in the Barracuda, the new address is Buethe Enterprises, P.O. Box 2401, Laguna Hills, CA 92653. Phone 714/837-2202.

Eloy '82 was a great start at a new site. It will be there again next October, so git on down there, y' hear!



Sweet Marie



Ken Brock and his T-18 "Sweet Marie".

A bunch of us kibitzers have been riding Ken Brock unmercifully for years now, never missing an opportunity to get in a dig or two about his "antique T-18". He's been building one so long, we tell him, that when finished, he'll have to have it judged in the Antique Category when he takes it to fly-ins. He's still working on the "antique", but last fall he and his wife, Marie, managed to blunt a few of our barbs by breezing into Eloy, AZ in a brand new T-18.

It's a beauty, from its chromed spinner to the "Sweet Marie" painted on the tail. Ken calls it his "flight tested T-18" because the wings already had maybe 500 hours on them before being installed on this fuselage. They were built by Chris Fast back in the T-18's infancy and were acquired by Ken a few years ago when Chris switched to the new folding wings on his airplane.

"I also had an engine and some other things lying around the shop," Ken says, "so we just decided to put them together and get another T-18 flying."

Ken Brock Manufacturing, as most of you know, is the major supplier of high quality stamped, machined and welded subassemblies for quite a number of the popular homebuilts around today, including the T-18. Would you believe **six pages** of Thorp goodies in his latest catalog! I suppose we would be safe in assuming that there was little time lost waiting for parts to put this T-18 together.

"Sweet Marie" is powered by a Lycoming

O-360 (180 hp) twisting a 72 inch lightweight Hartzell constant speed propeller. The spinner is a chromed version of the John Thorp designed unit that Ken makes and sells. The cowl is a high quality fiberglass copy of the John Thorp metal cowl made by Herb Schable of Torrance, CA — who also supplied the wing tips and wheel pants.

The canopy is from Gee Bee . . . and under it is a plushly upholstered cockpit and a truly professional looking IFR instrument panel. A DME was scheduled for installation a few days after the pictures you see here were taken. The seats are the Wortz design (available from Ken) that tilt several directions to allow access to the baggage compartment behind the seats and useful areas under the seats, themselves. They are very light and are quite comfortable.

Outside again, there's an auxiliary power plug (every airplane ought to have one) and a lot of neat and worthwhile finishing touches . . . like the routing of the breather tube down the left gear leg to keep oil off the belly. All the fairings that slick up a T-18 are installed and the airplane is finished in a beautiful paint job courtesy of DuPont and Perky Schmid.

Perky, who built and flies a beautiful T-18 of his own, has a paint shop in Whittier, CA and is a real artist with the masking tape and spray gun. The IMRON paint scheme was designed to provide decorative panels to call attention to the airplane's type in honor of John Thorp. The trim colors are dark brown

and orange, the same as on Ken's Turbo 210.

"Sweet Marie" weighs 951 pounds empty and trues out at 195 mph at 10,000 feet. At 7,000 feet, 2500 rpm and 22 inches it indicates around 170 mph. You see 1500 fpm climbing out at 25/25 and 120 mph.

The T-18 was the sensation of the homebuilt movement when it was introduced back in the 1960s — the aerial hot rod of its day. The sleek new composite jobs will run with it today on less power, but don't get the idea that the T-18 is a has-been. It is still a very exciting personal airplane. I hadn't been in one for quite a number of years, so was pleased to have the opportunity to go flying with Ken at Eloy last October.

The first thing that grabs you . . . literally . . . is the acceleration. With 180 horses and the CS prop straining at the leash, you really get plastered back in your seat on take-off . . . and the climbout is equally exhilarating.

There's a lot more to a T-18 than its impressive performance numbers, however. With a big engine and a small, lightweight airframe, you expect sparkling performance, but equally impressive are its handling qualities and basic stability. The airplane is well dampened in all axis. You have "right now" responsiveness when you make a control input, but let go and the little bird has a strong inclination to bring itself back to straight and level. Properly designed airplanes are supposed to do that and John Thorp did his work well on his T-18.

The Copperstate Fly-In at Eloy, Arizona

last October was "Sweet Marie's" second fly-in appearance (it was Grand Champion at El Mirage) and it came away with the Best Metal Custom Built award. Ken flew the T-18 quite a bit during the weekend and even sent Dick Rutan and Mike Melvill out in it to experience for themselves what the pre-VariEze days were like. They came back suitably impressed — especially with its take-off acceleration and powerful rudder.

But, so much for the airplane . . . it's high time we introduced its namesake, Marie Brock. Both natives of north central Texas, Ken and Marie moved to Los Angeles immediately after their marriage in 1955. After several years of working for others as a machinist, Ken opened his own business, specializing in sport aviation parts and subas-

semblies. From the beginning, Marie was a working partner in the enterprise, running the office while Ken managed the manufacturing operation.

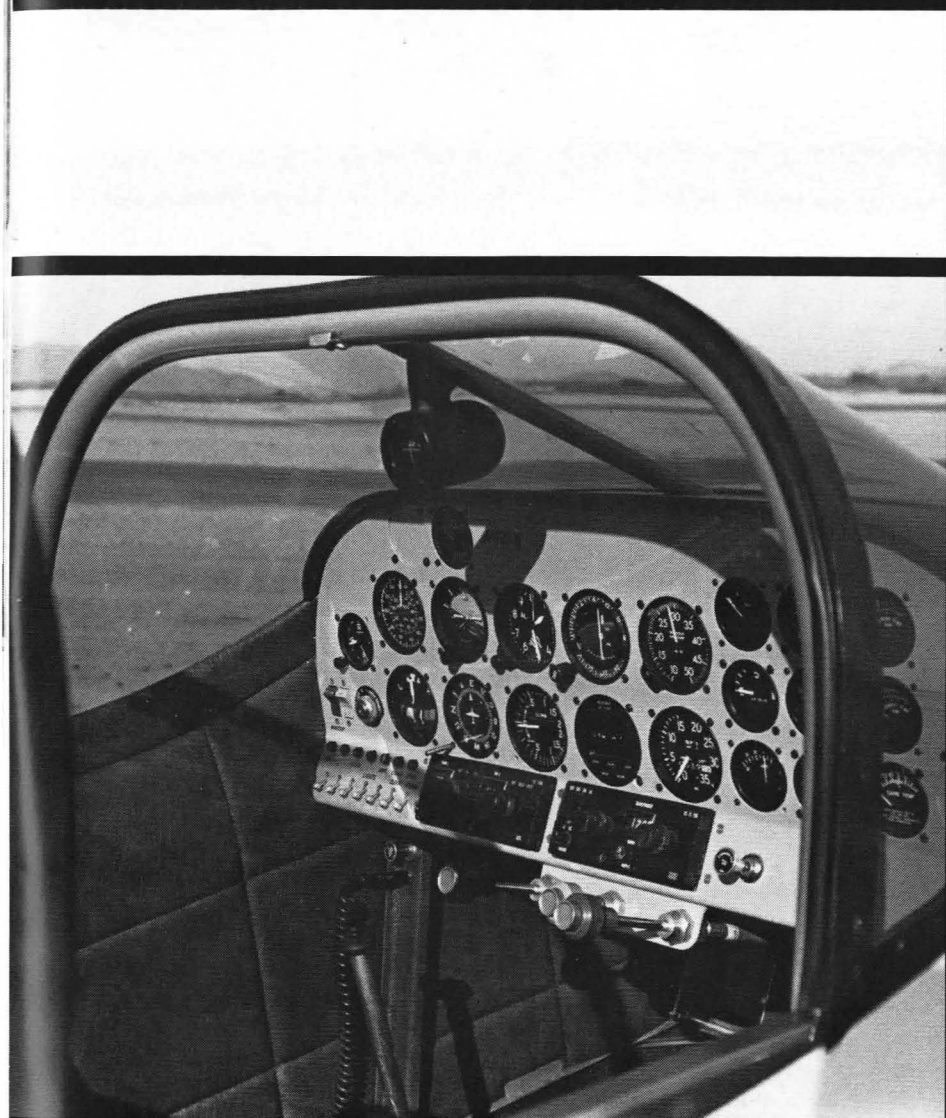
Ken's well known association with the gyroplane is just the most visible aspect of his aviation activity. He has always flown airplanes, also, and has owned a Stinson 108 for many years. Marie learned to fly it and has a number of solo hours in that neat ol' taildragger. She still flies regularly with Ken, but with a growing business, the raising of a son and daughter . . . and now with two grandchildren (and the third due next month) to dote over . . . she no longer solos any of the Brock fleet of aircraft (Cessna 210, Brantly helicopter, a Smith Miniplane, Aero-sport Scamp, Aerolight Eagle, the Stinson

[now being restored], the T-18, the "antique" T-18 project, to name a few).

Marie mans the Brock Manufacturing booth at Oshkosh and Sun 'N Fun every year and often is the person who answers the phone if you call their Stanton, CA office. She is Vice President of the company and is the office manager.

The old cliché about successful men being sustained by supportive wives is certainly true in the case of the Brocks. Marie has been at Ken's side throughout all his many successful ventures and the "Sweet Marie" on the T-18's vertical fin is a little well deserved recognition.

With a rapier wit and a quick smile for everyone, Marie Brock certainly is "Sweet Marie".



Sweet Marie Brock



Beachner V-8 Special



If the homebuilt aircraft movement has a redeeming social virtue, it is the constructive outlet it provides for one's creativity. Take the example of Chris Beachner. He has no formal education in aeronautical engineering and, in fact, does not even have an A&P license. Cessna, therefore, would not hire him to design airplanes and FAA regulations would prevent an FBO from putting him to work performing annual inspections on ATCed aircraft. Yet, through homebuilding, Chris has designed, built and now routinely flies all over the U.S. an airplane that is singularly unique from nose to tail. It would represent an engineering tour de force for an experienced aircraft designer . . . but for a young man who normally makes his living as a fire agate miner, it is a manifestation of a truly remarkable innate talent.

Unhampered by convention, Chris has modified a water cooled automobile engine to make it suitable for aircraft use and has designed an airframe around it . . . in such a manner that the finished product suffers little, if any, performance penalty due to the engine's excessive (by aircraft standards) weight. You've got to go back to the Ole Fahlin/Swen Swanson Plymo-Coupe of 1935 or that all time classic, Bernie Pietenpol's Air Camper, to find similarly successful water cooled engine/airframe combinations.

Since the size, shape and weight of everything behind the firewall of this airplane was dictated by the engine, let's start with it. It's an aluminum block 215 cubic inch V-8 out of a 1963 Buick Special, turned around so that its manual transmission bell housing faces forward. From it extends a one foot long prop

extension shaft and a bearing case holding 2 Timken beveled roller bearings. At the end of the shaft is a "knock off" prop hub with two sets of bolt hole patterns — small Lycoming and that of the O-200 Continental.

Yes, it is a direct drive set-up, turning a fixed pitch propeller.

The stock 4 barrel intake manifold is retained, but instead of the automotive carburetor, it has a sort of box bolted atop it from which a piece of ordinary exhaust pipe tubing extends back and down behind the engine where, attached to it, is a Posa injector carb, facing backward.

As you can easily see in the pictures, Chris made an exhaust collector to fit snugly up against each bank of cylinders, with the exhaust pipe coming off the front end and curving down and backward to exit from the bottom of the cowl. Knowing he would have to have a couple of good sized air scoops for cooling the engine, Chris went all out to make as tight a fitting cowl as possible to reduce frontal area to an absolute minimum. He even made a set of smaller than stock fiber glass valve covers to lower the profile of the engine.

Internally, the engine is stock and the same ol' GM centrifugal, breaker-point ignition system is still firing automotive plugs just like it did under the hood of a Buick. Regular leaded auto gas is used and with it, the automotive plugs will last about 50 hours. On cross country when 100LL must be used, they will last about 10 hours.

The little V-8 is cooled by what Chris thinks is a Chevy Vega radiator — it was given to him by a friend, so he is not certain of its

origin. It is mounted upright between the engine and the firewall and fed air by a scoop built into the bottom of the cowl. The system has a capacity of 12 quarts and Chris is currently running a 50/50 coolant mixture (water and antifreeze). He says it would cool a little better with 40% antifreeze and 60% water, but is more than adequate for his installation at 50/50.

Interestingly, Chris says water cooling alone is not sufficient to cool the engine. It must also have some air flowing over the cylinder banks, he has found, so there is also a scoop on top of the cowl — with outlets on either side of just aft of the exhaust headers.

With this combination of liquid and air cooling, and use of the cowl flap in the radiator scoop, coolant temperature runs to an extreme of about 215° on a 100° to 105° Arizona day . . . and in winter, requires some restriction of inlet area to avoid over cooling. Below 190°, the engine begins to get sluggish, he says.

The key to the success of the engine installation is the fact that Chris is making a very modest demand for horsepower — his estimate is 125 hp at 3600 rpm at sea level. He can cool it at that rpm and the stock internal parts can live within that engine speed. It is also the rpm range within which the valve train and ignition system were designed to operate.

The propeller in use when we saw the airplane during the Copperstate fly-in at Eloy, AZ is a Sensenich fixed pitch metal job with a diameter of 58 inches and a 48 inch pitch. It's not the optimum prop, Chris believes, and

he was set to try one of Bernie Warnke's Almost Constant Speed jewels after the fly-in.

A sort of bed-type chromemoly engine mount is employed. It attaches to the fuselage at the firewall much like a typical Lycoming or Continental mount, but at the other end has bearers that run down both sides of the block with 3 attach points per side — at two of the main bearing webs and holes drilled in the bell housing flange. 1967 Chevy upper control arm rubber bushings were used as shock mounts at each attach point.

The basic engine, minus accessories and prop shaft, weighs 305 pounds. With accessories and prop shaft it weighs 354 pounds. And ready to fly, everything ahead of the firewall weighs 400 pounds.

Behind all this internal combustion exoticism is an airframe interesting in its own right. It's a low wing monoplane that is fairly good sized as homebuilts go, with a span of 24 feet and a length of 18 feet 6 inches. The exterior is foam and glass, but only in the case of the tail surfaces is the material used in primary structure. The fuselage is a welded steel tube frame with an outer shell of 6 ounce fiberglass cloth and epoxy resin over a polyurethane foam core. The foam is glassed on both sides in the cockpit area, as is the turtledeck. A number of resins were used, but Chris liked the Rand Robinson epoxy best of those he tried.

The tail surfaces are made just like those of a KR-1 or KR-2 — spruce spars and a solid foam core covered with fiberglass and epoxy resin.

The wing consists of a center section — to which the main gear attaches — and two outer panels. The center section is integral with the fuselage and its spar carrythrough is a welded steel tube truss, filled with unidirectional glass cloth for additional strength.

The outer panels, like the tail, borrow heavily from the Ken Rand designs — with a spruce box spar (main) and a solid spruce secondary spar absorbing the loads and a foam and glass outer shell forming the airfoil.

As the pictures reveal, the airplane is a retractable taildragger. The mains are homemade struts containing die springs and a brass bushing — no hydraulics of any kind. 5:00x5 Gerdes wheels and brakes are used. The tailwheel is currently steerable, but Chris is doing a lot of thinking about a lockable unit.

It may not appear to be in pictures, but the Beachner V-8 Special is a two-seater . . . actually more like a 1½ seater. The front seat has lots of room, especially across the shoulders where the fuselage is 26 inches wide . . . but immediately behind it is a sort of jump seat in which a small person can crouch with his or her knees extending up on each side of the pilot. (They make good armrests, Chris says with a wry smile.) Gear and flap levers are mounted alongside the pilot, but there's still room for knees.

A Sonerai II bubble has been used to make a sliding canopy and the big windshield was molded by Gee Bee, using a mold Chris made. Gee Bee has subsequently developed a Pitts S-2 bubble that can also be used on the V-8 Special.

Fuel is carried in two fuselage tanks — 21 gallons ahead of the instrument panel and 13 in a tank mounted behind the rear seat. With a 110 pound passenger and 40 pounds of baggage (stowed between the passenger and the aft fuel tank), Chris is restricted to 8

Chris Beachner



gallons in the rear tank.

The airplane has a stick control with a push/pull tube to the elevator. Cables run out to the outer wing panels where they actuate the ailerons via torque tubes. The usual rudder cables are utilized, with spring loaded pedals . . . upon which you trip the light fantastic in conjunction with heel brakes to keep the nose on the centerline during take-off and landing roll out. Flaps are fitted and are used for take-off (7°) and landing (40°).

Empty weight, including oil and coolant, is 840 pounds. Now, think about that — the engine and its accessories weigh 400 pounds, which leaves just 440 for the airframe, including a 24 foot full cantilever wing. That's quite an accomplishment and is, of course, the key to the airplane's performance on a relatively modest 125 horsepower.

Wing area is 86 square feet, exclusive of the fuselage. It's 96 square feet if you figure wing tip to wing tip. Using the latter and a gross weight of 1296 pounds, the wing loading is 13.5 pounds per square foot.

With the metal prop in use at Eloy, the engine will turn 2750 rpm static at full throttle. As the airplane accelerates through 90 mph, the rpm has increased to 3200. At 120 mph, which is the best climb speed, rpm is up to between 3400 to 3600, depending on altitude. From near sea level, the 120 mph climb yields 1500 fpm with just Chris and 10 to 15 gallons of fuel on board.

At cruise, he throttles back to 3300 rpm and a 148 mph indicated airspeed. This is just over 50% and runs 5 gph through the V-8. Winding it up to 3600 rpm runs the indicated airspeed to 160 mph and fuel consumption to 6 gph. The engine can be run harder, but the prop just gets less and less efficient, Chris says.

With the gear and flaps up, the wing stalls at around 64 mph indicated. Down and dirty, the stall comes at 48.

At Eloy we admired the really slow approaches Chris made to landing. He told me later his approach speed was "anything above 65 mph" — dictated more by the necessity for keeping ahead of the aircraft behind him in the traffic pattern than by the V-8 Special's slow speed capability. Full flaps (40°) produce a steep enough approach attitude for good over the nose visibility and Chris normally makes a wheel landing in order to continue to see where he is headed. It three-points nicely, he says, and ground handling is easy, if you want to exercise your peripheral vision rather than looking over the nose.

The airplane I've been describing and that you see pictured here is not the same as it was when it made its first flight on September 22, 1978. What you see is an evolution — Chris has been through 3 different landing gear systems, went from go-cart wheels to the present aircraft units, etc. The biggest change, however, was in the fuselage structure. It originally was a wood frame fleshed out with foam and glass . . . again, a la KR-2. Two years ago, he built the present steel tube/foam and glass fuselage, which reduced weight substantially. Then, last winter the outer wing panels were rebuilt — plus a new cowl, turtle deck, rudder and elevator.

"Like most first time composite builders, I used too much resin in the beginning. I cut way back this time and really reduced the weight."

Finally, however, the airplane is what Chris wants it to be, and he intends to put plans on the market early in 1983 . . . quite likely by the time you are reading this. He has been besieged at fly-ins for information on his engine conversion, so will sell the drawings and instructions for it separately. The engine, incidentally, is still being built in England by Rover. For further information you can purchase a \$5.00 info kit from: Chris Beachner, P.O. Box 31294, Tucson, AZ 85715-1294 (that's a new 9 digit zip code).

Chris Beachner grew up on Vashon Island in Puget Sound — just across from Seattle. He was airplane crazy from birth, just like the rest of us, and used to tag along with his neighbor, Ted Hendrickson, to watch him fly models. After high school, he worked in Boeing's wind tunnel model shop until he and thousands of others were laid off when the U.S. SST was cancelled.

He moved to Vancouver, Washington for 3 years and actually started the V-8 Special there. Ironically, he really doesn't remember why he chose the Buick V-8 to power his homebuilt, but recalls it was light, available . . . and cheap! He had learned to fly but could not afford a factory job, so started

dreaming of — what else — building his own. All you've just read followed in rapid succession.

Chris and his wife own and operate a gem stone business, specializing in fire agate. Some years ago, they began spending winters in northwestern Arizona mining the stuff. Last fall, they located permanently in Tucson so they'll have year round weather for their airplane and gem stone activities.

Auto engines have always been of great interest to homebuilders, largely because of the low initial cost as compared to aircraft engines. An airplane designed specifically for an auto engine is bound to get a lot of attention . . . but there is going to be an element beyond all this as far as the Beachner V-8 Special is concerned. When the replica warbird fans see this thing with its low thrust line, they are gonna absolutely flip. Round the wing and tail surface tips, redo the windshield, move the radiator back and, voila! — the spittin' image of a Kawasaki Ki-61 Tony! Others will look at it and see a Me. 109F or a Heinkel 112 or . . . ?

Most, fortunately, will see it for what it really is — a very nice sportplane with a very economical engine.





HOWARD

O D Y S S E Y

On September 18, 1940 S. E. Burns of the Howard Aircraft Corporation of 5301 W. 65th St., Chicago, IL signed the Bill of Sale for Howard DGA-15P, NC22423, Serial No. 522 powered with a Pratt & Whitney R-985-SB-1, Serial No. 1549. The new . . . and first . . . owner of 22423 was the West Virginia Board of Aeronautics, Charleston, West Virginia. For the next 16 years the Howard would serve as the official airplane of the state's governors, winging them in and out of Charleston's hilltop airport . . . never referred to by eastern pilots as anything other than "Charlie West".

On September 24, 1956 the Howard was purchased by Skylanders of Cincinnati, which sounds like a skydivers club. If true, it was quite a comedown for a proud ol' bird . . . from transporting heads of state to serving as a mere elevator for jumpers.

Fortunately, Skylanders used and no doubt severely abused 22423 for only 15 months, selling it to Walter Littrell of Cincinnati on December 18, 1957. He kept it for 3½ years before selling out to Jesse Bortel of Ashland, Kentucky on May 20, 1961. Jesse sold it a little more than 5 months later to Louis C. Woodrum, Jr., also of Ashland — on November 1, 1961.

The next transaction is a little confusing.

Dolph Overton, then of Mullins, South Carolina, had 22423 signed over to him on January 19, 1963 by Carlton C. Clark, president of Tri State Aviation Service Company of Ashland . . . which was a pretty good trick since Tri State didn't get its own Bill of Sale from Louis Woodrum, Jr. until March 1, 1963 and it wasn't notarized until July 13!

By that time, Dolph was flying the Howard all over the country in pursuit of his first million or two. A jet ace in the Korean War — in the F-86 — Dolph had returned to his native South Carolina to enter private business and later bought the 15P for personal transportation. He was struggling to start a new company at the time and in October encountered a situation in which he had to raise some cash to keep forging onward and upward, so the Howard had to go. He sold it to a building contractor, Harstad Associates, Inc. of Seattle, on October 25, 1963.

Dolph Overton would go on to amass one of the largest private collections of antique airplanes ever under one roof. In 1968 he created a transportation museum named Wings and Wheels, located on its own airport in Santee, South Carolina. Your editor and wife helped open its doors early in 1969. In the late 70s, the collection was moved to the Orlando, Florida Jet Port but hard economic

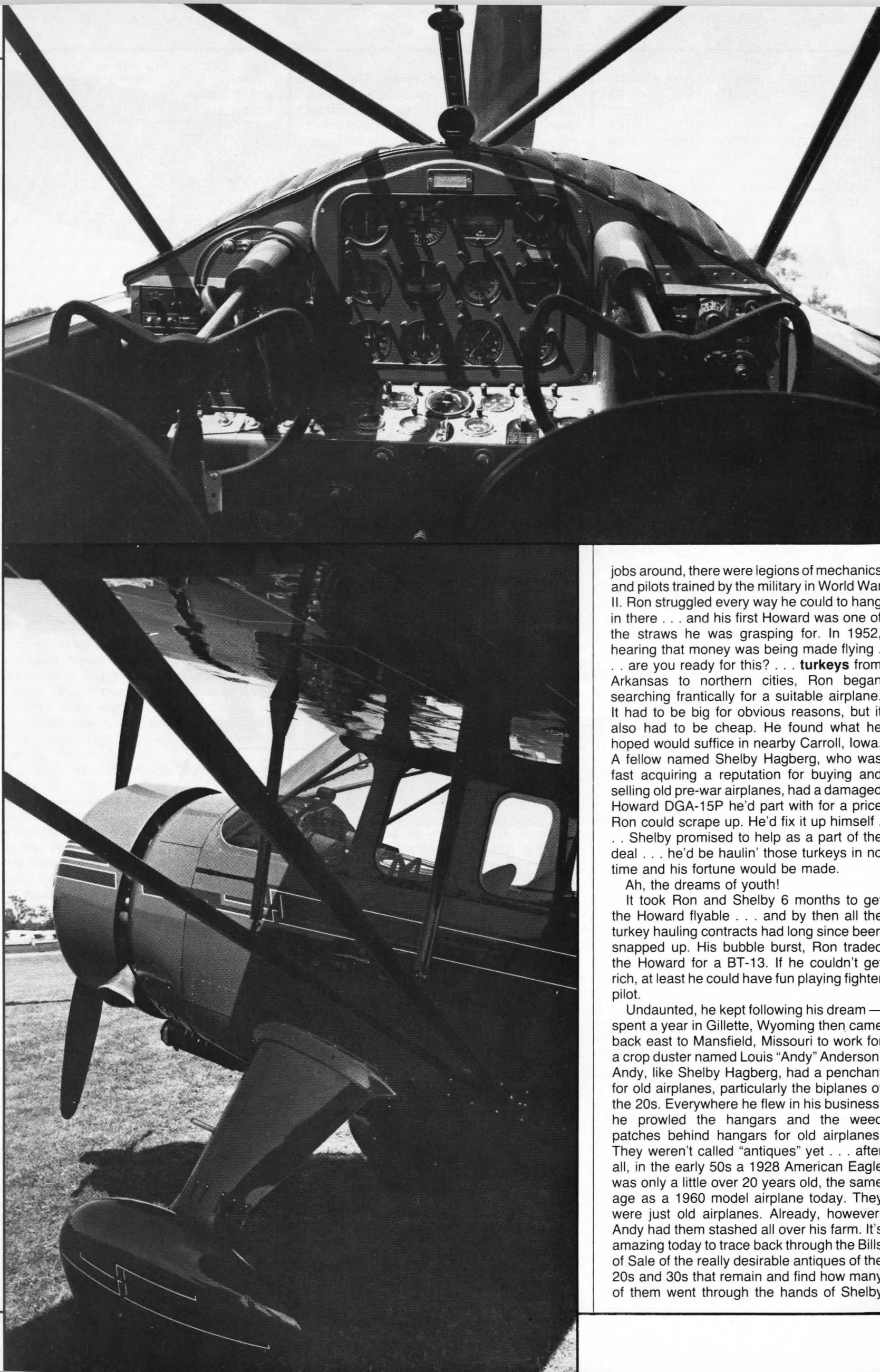
times forced the closing of Wings and Wheels and the widely reported auction of its aeronautical and automotive artifacts in December of 1981.

Dolph always regretted the necessity for selling 22423 and always wanted it back.

Harstad Associates flew the Howard for 7 years before putting it up for sale in the fall of 1970. One day they got a call from a corporate pilot from Rockford, IL who seemed a little more interested and certainly a lot more knowledgeable than the typical inquirer. Before they knew it, he was out there looking the airplane over, and on October 19 had his Bill of Sale and was in the air and headed east for Rockford.

Ron Rippon was the new . . . and to this day the last . . . owner of 22423. Well known in antique airplane circles as a Howard expert, this was his third DGA-15. He owns two more restorable ones, N1227 and N65476, plus the remains of several others he bought for parts.

Ron is a native of Sioux City, Iowa who grew up airplane crazy just like the rest of us. He determined very early in his life that he was going to make aviation his career, but entering the nation's workforce in the late 40s and early 50s made that a very tough row to hoe. For every one of the few aviation



jobs around, there were legions of mechanics and pilots trained by the military in World War II. Ron struggled every way he could to hang in there . . . and his first Howard was one of the straws he was grasping for. In 1952, hearing that money was being made flying . . . are you ready for this? . . . **turkeys** from Arkansas to northern cities, Ron began searching frantically for a suitable airplane. It had to be big for obvious reasons, but it also had to be cheap. He found what he hoped would suffice in nearby Carroll, Iowa. A fellow named Shelby Hagberg, who was fast acquiring a reputation for buying and selling old pre-war airplanes, had a damaged Howard DGA-15P he'd part with for a price Ron could scrape up. He'd fix it up himself . . . Shelby promised to help as a part of the deal . . . he'd be haulin' those turkeys in no time and his fortune would be made.

Ah, the dreams of youth!

It took Ron and Shelby 6 months to get the Howard flyable . . . and by then all the turkey hauling contracts had long since been snapped up. His bubble burst, Ron traded the Howard for a BT-13. If he couldn't get rich, at least he could have fun playing fighter pilot.

Undaunted, he kept following his dream — spent a year in Gillette, Wyoming then came back east to Mansfield, Missouri to work for a crop duster named Louis "Andy" Anderson. Andy, like Shelby Hagberg, had a penchant for old airplanes, particularly the biplanes of the 20s. Everywhere he flew in his business, he prowled the hangars and the weed patches behind hangars for old airplanes. They weren't called "antiques" yet . . . after all, in the early 50s a 1928 American Eagle was only a little over 20 years old, the same age as a 1960 model airplane today. They were just old airplanes. Already, however, Andy had them stashed all over his farm. It's amazing today to trace back through the Bills of Sale of the really desirable antiques of the 20s and 30s that remain and find how many of them went through the hands of Shelby

Hagberg, Vince Burke, Andy Anderson and a few others who pioneered what was to become the hobby of antique airplane collecting.

After a stint with Andy, mostly as a mechanic, Ron decided to move on because his goal was to become a professional pilot. He flew for a FBO at Springfield, Missouri for a while and then in 1956 his big break came. He signed on as a corporate pilot with Amerock, a decorative hardware producer in Rockford, Illinois, and has been with them ever since. Today, Ron flies a Lear 35 . . . and sitting in the hangar with it is one of the Lear Jets of the 30s, his Howard DGA-15P.

As I've indicated, however, there was still another Howard between the erstwhile turkey transport and 22423. And to keep everything in order, still another golden oldie that, in a round about way, was responsible for Howard #2. Catching a bad case of Andy Anderson's antique airplane fever, Ron had begun to look around for a rare bird of his own . . . and found one in the form of an almost extinct Curtiss Wright Travel Air Speedwing. He bought it and hauled it with him all over the place for 15 years. He worked on it when he could, but never did get it flying. Ultimately, he sold it to another enthusiast in Milwaukee — who died a year or so later. Ron told Herb Harkcom of Tulsa about it, he bought it and was still working on it when he, too, died a couple of years ago.

Ron, without an airplane for the first time in quite a spell, began to think about the Howard he and Shelby Hagberg had pieced together so many years ago. He had been impressed with the rugged simplicity of the big ol' taildragger and like any true believer, longed to feel the throb of a 985 once again. He began perusing Trade-A-Plane and, ultimately, bought N95462 in Toledo, Ohio.

The airplane was licensed and flying, but Ron went to work to make a showpiece out of it. The engine was chromed and polished, a new red paint job was applied and soon he had one of the most beautiful airplanes flying. Rockford's municipal airport was, of course, the site of the EAA fly-in in the 1960s and Ron had a front row seat . . . literally. The Amerock hangar was directly across the air show runway from the fly-in area and every day Ron would taxi the big Howard over to the antique display line and then just before show time, would taxi it back, put it in the hangar and settle back in a lawn chair to watch the likes of Bill Adams, Bill Dodd, Bob Hoover, Paul Poberezny, Big Nick Rezich, etc. — almost directly overhead. Andy Anderson and a bunch of his friends would be there with a tub of iced beer. Great days they were.

Ron owned 95462 for 7 years before John Turgyan made him an offer he couldn't refuse. For the better part of the decade of the 70s, John would make the big red Howard the most visible antique airplane in the world. There were few fly-ins from coast to coast he didn't make at one time or another and he made the larger ones every year without fail. John finally sold 95462 to Chub Trainor who now bases it at the famed Santa Paula airport in California.

Finally, then, we come full circle. Howard-less again in 1970, Ron got wind of 22423 through his friend Bill Wright, went airline to Seattle, as I've already related, and flew it home. Determined to REALLY do a number on this one, he took it apart to the last nut



Ron Rippon

and bolt and spent the next 8 years restoring it. There's not a lot to say except that it was a TOTAL restoration. Every part and subassembly that was worn or deteriorated was replaced and everything else was stripped, repainted or replated. All the sheet metal was replaced with new, all the control cables were replaced . . . you name it — new floorboards, new interior, new Beech King Air type cabin ceiling, new instrument panel with new 3 1/8" gyros and the necessary modern electronic goodies to have an IFR certified airplane. The fuselage and tail surfaces were covered with the last Irish linen envelopes B & F Aircraft had in stock (Ron traded an oil cooler for 'em) and Grade A was used on the ailerons and over the plywood wing skins. 30 coats of dope were sprayed and sanded, sprayed and sanded, etc., etc., before a final finish of red Alumigrip (2099) trimmed in maroon (2089). It's one of the most tasteful, beautiful combinations ever put on an airplane, in my opinion.

It should be pointed out that Ron did not set out to build up a 100% 1940 factory authentic antique. He intended to fly the airplane regularly — including IFR — so he opted instead for a modern interior and panel. At the 1978 AAA National Fly-In at Blakesburg, Iowa, where members vote to choose the top airplane, Ron's Howard was chosen as Grand Champion. In the EAA judging system the modifications place the airplane in the Custom Antique Category, so in 1979 it easily walked off with the Custom Grand Champion trophy at Oshkosh.

The DGA came out weighing 2900 pounds empty — about 200 over its original weight. Ron points to the super finish, the sound-proofing and custom interior as the culprits . . . although he can't really tell any difference

in the plane's performance. Nearly all the 450 horsepower cabin jobs of the late 30s were advertised as "200 mph airplanes" — the Staggerwings, Howards, SRE Wacos — but there has always been some doubt about the claims. I asked Ron for some real world performance figures, to which he replied, "It will true out at 200 mph, but you have to use climb power to get it — 30 inches and 2000 rpm, burning 25 or 26 gallons per hour. More realistic is 55 to 60% at altitude — that's about 250 horsepower, which will give you 165 to 170 mph and 19 to 20 gallons per hour. That's still pretty respectable — especially so considering the room, comfort and 7 1/2 hour endurance you have at that power. You can make 1000 mile legs in the airplane, if you want to sit in it that long.

"It gets out short — 500 to 600 feet, fully loaded, and has an initial climb rate of about 1000 fpm. Lightly loaded, you get an initial rate of nearly 2500 rpm. It will settle down to about 900 to 1000 fpm and hold that right on up to 10,000 feet."

Ron has averaged about 60 hours per year since the Howard was flown again in 1978, so it's no hangar queen. That's a lot for a show plane.

As I mentioned earlier, Ron has two more restorable Howards. One was obtained from a vocational school in Minneapolis and the other from a pile of pieces that had been stored in a hangar at Santa Paula for the past 21 years. Ron put it together in 7 days and flew it home!

I asked him what he planned to do with them and he said he would eventually rebuild them, at which time "some of them will have to go so I can get even again."

"I've gotten involved, I guess."





A FAST KR-2

For maybe a quarter of an hour we watched the late evening matchup — an O-200 powered Midget Mustang and a KR-2 with a normally aspirated Revmaster 2100D under the cowl rat racing around the fly-by pattern. 'Round and around they came, going at it hammer and tong. They took turns leading, but neither seemed capable of really pulling away from the other. Finally, the rapidly fading light of a desert evening forced them down out of the sky and to their parking spots on the Eloy, AZ ramp. Shutting down his engine, the Midget Mustang pilot, Dick Lambert, opened his canopy, grinned broadly and exclaimed to everyone within earshot:

"Now, that's a **fast** KR-2!"

We'd already come to that conclusion, but Dick's pronouncement confirmed that he had been going all out to blow off the KR-2, but hadn't been able to do it. He'd seen a little over 200 on the clock in some of the diving passes, he admitted, but hadn't been able to shake his "shadow".

Doing a little grinning himself through all this was the KR pilot, Lance Neibauer of Redondo Beach, CA. He already knew he had a fast airplane. It had been completed in May and by now in mid-October, he had already flown it 130 hours, including a trip to Oshkosh. In the process, he had blown off every KR-2 in the area . . . and a few other types as well. His KR-2 was fast alright . . . he just didn't know why.

Lance had built N382L in just over a year and had followed the plans in all but a few relatively minor instances. He had kept it light, ending up with an empty weight of 579 pounds — which is good for a KR-2 with a "big" engine (full electrics). It has a slick finish which may be producing some natural laminar flow and maybe he built it just a little straighter than most other KR-2s . . . whatever,

it's a rip-snorter, outrunning even the turbo charged jobs with the Maloof CS props down low. 382L runs a 52"x50" wooden fixed pitch prop by Great American.

How fast? Well, Lance says he doesn't go by his airspeed indicator or his blankety-blank electronic tach — he's had 5 in the airplane already and none of them work — so he has used a stopwatch to time full throttle runs over a measured course. At 1000 feet and in smooth air, he is getting a consistent two-way average of 193 mph. That's solo, of course. Solo cruise is 175/178 and the rate of climb is a little over a thousand fpm, initially. 900 fpm can be held for several thousand feet. Loaded to the plane's 1050 pound gross weight, the rate of climb drops off to between 500 and 800 fpm, depending on atmospheric conditions. On the way to Oshkosh last summer, Lance got his first taste of high country operation. He made a full gross take-off from Gallup, NM with the density altitude pegged at 9400 feet. To his relief, then pleasant surprise, the KR-2 climbed right on out.

"I couldn't believe it!", he says. "I got a picture of the instrument panel with the altimeter showing 11,500 feet because I figured that loaded as we were, that was as high as it would go . . . but, boy, in another half hour we were at 14,700 and were still climbing maybe 40 to 50 fpm."

Lance is just about as happy with the plane's performance at the other end of the scale. It will slow fly — again, solo — right on down until the airspeed indicator goes off the bottom of the scale. Good aileron control is available down as low as 50 mph, indicated. When the thing finally stalls, the left wing breaks first, leading Lance to conclude that the washout is just a little different on that side. At cruise, the left wing wants to

ride up, causing him to have to hold a bit of left aileron to keep the wings level. In slow flight at 50 mph, it takes a lot of right aileron to stay level.

With all this, you might think the stall would be violent, but it isn't. As the stall angle is approached, the flat bottom of the fuselage begins to do an imitation of a set of bongo drums . . . "It's like it's saying, 'We're gonna stall, gonna stall, gonna stall.'" Finally, at a pretty extreme angle, the left wing sort of mushes over, after which just the slightest easing up of back pressure has the wing flying again.

Lance says all the KR-2s are somewhat sensitive in pitch, but it is characteristic to which he had little trouble adapting. The rudder and aileron are quick, but to a lesser degree than the elevator. Actually, the KR-2's inflight manners have never been much of a problem — it's on the runway that some pilots have had their thrills. Too many pilots with a lack of experience in tailwheel airplanes have tried to fly them without an adequate check-out . . . and that'll get you every time. Then, like most homebuilts, the design does have its peculiarities.

The KR-1 and KR-2 have one of the most unique landing gears ever put on an airplane. It's nothing but a single flat leaf spring mounted up in a slot in the bottom of the fuselage and wing center section. The short main gear legs — simple aluminum castings — are bolted on the ends. The spring is hinged so that gear extension and retraction is accomplished by grabbing a little lever (bolted right to the spring) and pushing or pulling to pivot the whole darn thing through an arc of 90°. The main gear legs zip straight backwards and up to nestle in the wing, with about half of the wheel exposed. The gear is locked up and down by a little arm or latch

with a notch in it that hooks the edge of the spring and holds it in place . . . most of the time. Ken Rand's collapsed on him several times when he attempted to taxi over a rough surface. The plane would get to bouncing and the latch would pop off, plopping the bird on its belly and sending prop splinters flying in all directions. Over the years, however, improvements have been made and, generally, builders seem to have learned to live with the gear. Lance likes his, preferring its utter simplicity to some possible, inevitably more complex and expensive alternative.

He also likes the brake system . . . which beats out even the landing gear for being the darndest thing ever hung on an airplane. The KR-2 uses go-cart wheels and mechanical brakes. Each brake unit has a little actuating arm, to which a cable is attached. The cable runs up the gear leg, bends around a pulley, runs down parallel to the leaf spring through the cockpit and out to the other gear. To apply the brakes, you simply reach down, grab the cable and pull. Obviously, you must pull from the middle to apply equal braking at each wheel. If you want differential braking, you pull on the cable a little closer to the wheel you want to brake. Believe it or not, it does work but many builders today rig up toe or heel brake pedals or, at least, a brake handle, like those on a Tripacer or early Cherokee. You have direct tailwheel steering, so simultaneous braking of both wheels will see you through all but the sharpest turns on the ramp. Lance, incidentally, put springs in his tailwheel steering mechanism to absorb the blows inflicted upon his tiny tailwheel by rough runways, assorted rocks and whatnot. He thinks all KR's should have them.

Take-offs are pretty straightforward, but landings require a little more attention. Lance

says he approaches at 65 to 70 and tries to do a tail low wheel landing. When the mains touch, he pushes the stick forward for visibility ahead AND BEGINS BRAKING AS SOON AS HE CAN GET OFF THE THROTTLE. He holds the tail off as long as it will stay up, by which time the KR is virtually down to walking speed. With this technique, he rarely uses more than 1000 feet of runway. But then, he is a high time pilot with loads of tailwheel time, right?

Wrong.

Lance soloed in 1976 and until May of this year had accumulated just about 180 hours. From the time he soloed his KR-2 in May, however, until we saw him at Eloy in October, he had almost doubled his previous 6 years flying time! With a little over 300 hours, he is still a fairly low time pilot, but he certainly is current in the KR-2.

Putting 130 hours on the plane in 4 months, Lance obviously has had little in the way of trouble with it. Mostly, he has simply been climbing the learning curve. His engine, for example, is fitted with a Revmaster modified Posa injector carb with mixture control and provision for alternate air. It has a Number 5 needle which has proven to run the engine too learn. On the trip to Oshkosh, it ran well under all conditions and burned only 3.5 gph . . . which Lance thought was great. Back home, however, he pulled the plugs and found them to be fried to a fare thee well. Their normal .016 gap was burned out to as much as .050. New plugs soon began showing signs of excessive heat, also, so the Number 5 needle was filed off a bit to permit a richer mixture at higher throttle settings. Fuel consumption is up to 4 gph at high cruise, but the plugs are looking good again.

Earlier, it was mentioned that Lance had

incorporated some relatively minor changes to the airframe. The most notable one was widening the fuselage 2 inches through the cabin area — at the upper longerons only. The lower longerons were unchanged. The extra width — to 38 inches at the shoulder line — really helps in terms of comfort, Lance says.

He bought the Rand Robinson moulded fiberglass parts but had to rework them to obtain a correct fit on his altered fuselage. Lance also changed the bubble canopy. When built strictly to plans, the KR-2's canopy is almost an arc of a circle when viewed head on. This is O.K. for little guys like Ken Rand, but taller pilots need more head room out to the side of the bubble. Lance ordered a special .150 canopy that, viewed from front, looks more like a T-18 bubble — flatter on the top and with straighter sides. It's still a one-piece swing-over unit, however, instead of the fixed windshield, gullwing door type favored by Dan Deihl, Brian Hennemen and other KR builders.

The cabin area was lined with a sticky backed commercial sound proofing material that has proven quite effective. NACA scoops were built in on each side of the fuselage for cabin ventilation and really do a great job, according to Lance. They make no noise, yet will blow you half out of the cockpit, he laughs.

Other mods included an adjustable cowl flap, mounted below the oil cooler so that it stays on the airplane when the cowling is removed. He also installed a belly flap to help slow the airplane down during landing, but has never used it. He has become accustomed to landing slowly without it, so may eventually take it off.

Lance also beefed up his landing gear latching system. He used the Rand Robinson

Lance Neibauer



hardware, but replaced the 1/4" bolts with 5/16" and 7/16" ones. The entire gear mechanism was blocked up some and a special tailwheel unit was made to make the airplane sit up a little for extra prop clearance — but at the same deck angle as a stock KR-2.

A materials substitution was made when he began glassing the airframe.

The versamid base Rand Robinson epoxy had been used for the woodwork and is excellent for that, Lance believes, however, he switched to Safe-T-Poxy for the foam and glass layups. He did so because versamid has a heat softening threshold of 118°, whereas it is 193° for Safe-T-Poxy. Skin temperatures of 150° are common when an airplane sits out in the desert southwest, he explains, so he prefers the extra margin the Safe-T-Poxy provides. When finished, the airplane was painted the obligatory composite white, using DuPont's Centauri acrylic enamel with the catalyst hardener.

You always have to inquire about the fuel capacity of a KR-1 or KR-2. Both have a fuselage tank ahead of the instrument panel, but may also have wing tanks of varying capacity. The way the wings are made makes it easy to build in voids for fuel and, since they will be pretty much on the CG, allows a builder to make provision for whatever he wants . . . or the wings can lift . . . or the landing gear can support. Lance didn't go completely overboard — he has 14 gallons in the nose and room for 10 gallons in each wing — 34 gallons or 204 pounds of gasoline. At 175 mph and 4 gph, he has a single place airplane with a still air range of 1400 miles — and a 2 gallon, half hour reserve!

Lance Neibauer is a native of Michigan and is a Michigan State graduate. He is in the advertising and graphics business . . . and as a result of building his KR-2, one of his more recent clients is Jeannette Rand and her Rand Robinson Engineering. He

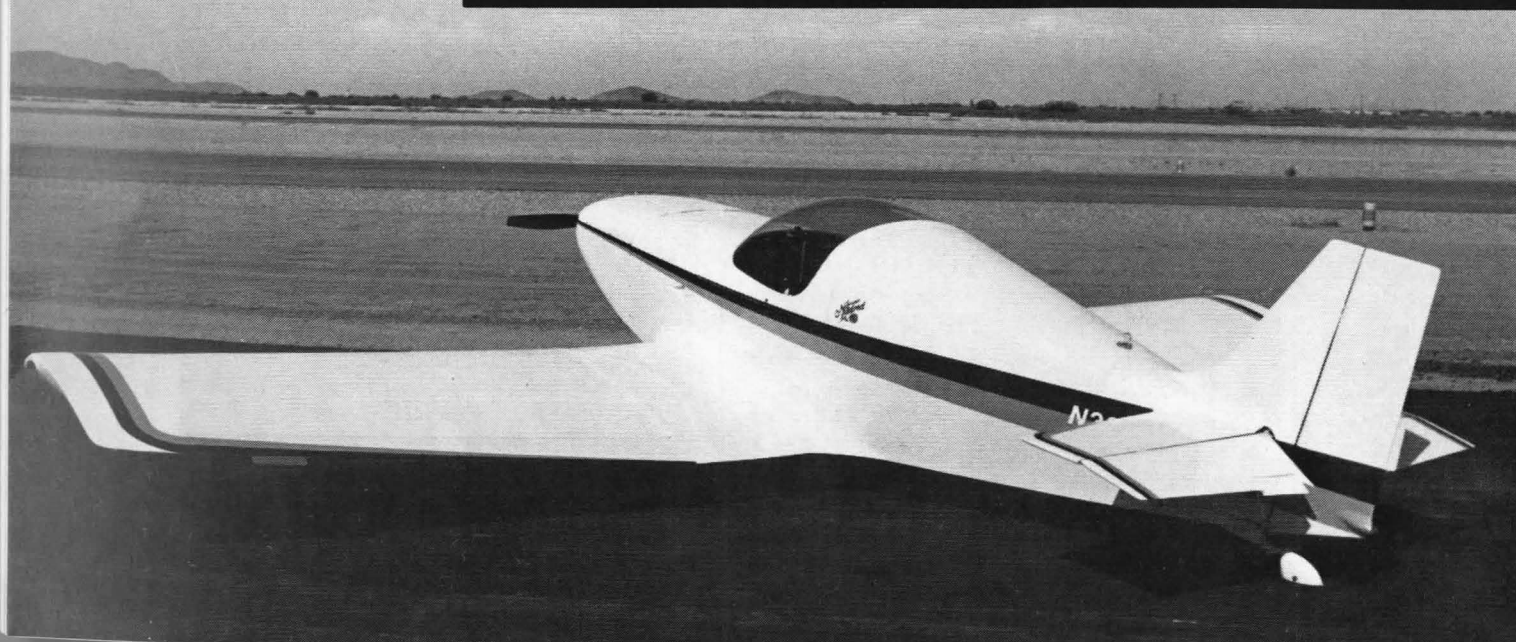
moved to California in 1975 and hasn't missed the frigid Great Lakes area a single day in winter yet!

Lance is extremely pleased with his KR-2. As mentioned earlier, its speed has been a pleasant surprise and it has lived up to the claims made for it as far as economy of operation is concerned. He has \$8,000 in the airplane . . . about \$3,000 in the airframe and the rest in a new Revmaster, prop, etc.

Introduced in 1974, the KR-2 is getting to be a veteran design, by homebuilt standards. It is still being built in great numbers, however — probably within the top five of all the homebuilts on the market today. George Gibbons of Wicks Aircraft says it is still one of the least expensive and easiest to construct of all the homebuilt designs. Lance concurs, adding that the performance for the cost is awfully hard to beat.



"Sweet Mildred" is Lance's mother. The KR-2 was completed on her birthday.



In Retrospect... **Mooney Mite**



Tony Terrigno's Mooney Mite.

No one ever accused Al Mooney of being a slave to convention . . . and his little single place M-18 Mite is living proof. In the late 1940s, the U.S. was awash in airplanes. The government had dumped thousands of World War II airplanes on the civilian market at giveaway prices and the lightplane industry had flooded what was left of its market in a wild orgy of production that saw an astounding 32,000 planes shipped in 1946 — a record that's never even been approached to this day. Yet, in the midst of all this wretched excess, Al Mooney decided what the world needed was a single place, highly efficient little airplane that could be bought for about \$1700.

Possessed, as we are, of 20/20 hindsight, it's interesting to speculate how many times Mooney had to suffer through put-downs like, "Shucks, Al, fer them kinda bucks I can buy me three or four brand new BT-13s . . . each full of gas!" Indeed, knowledgeable aviation people have always questioned the existence of a viable market for single place **certified** airplanes. Almost everyone who ever flew a Mooney Mite thought it was a real blast, but when the time came to plunk down the hard, cold cash, most ended up buying a used two-place of some sort. From 1949 to 1955, only 291 Mites were built and most went to FBOs, who used them as rental planes. As usual, it was only when the little speedsters were sold as used airplanes that they began to impact the private owner market.

Once it was out of production and almost totally in the hands of private individuals, the Mite took on an entirely different character. Over night it became the object of a virtual cult, its devoted owners treasuring the airplane to a degree that transcends any of the normal everyday yardsticks we use to evaluate aircraft. But, once anything becomes a person's hobby, yardsticks no longer matter. The successful pursuit of happiness is all that really counts.

But enough of the whys and wherefores, the fact is Al Mooney did it . . . went right out and built a fast little single placer, even if the world **wasn't** beating a path to his door for one.

Al Mooney's first cut at the M-18 (signifying his 18th design) was, from a technical standpoint, even more interesting than the production aircraft that later evolved. He wanted to build **his** version of "everyman's airplane" . . . which meant, first and foremost, it had to sell for about the same price as a new Ford, Chevrolet or Plymouth . . . about 1700 or 1800 late 40s dollars. The only way, the only **prayer** he had of pulling that off was to adapt a cheap, mass produced engine of some sort for aircraft use . . . and get it certified by the CAA. Al did a lot of research and was pretty close to choosing an industrial engine (Waukesha or Hercules) when he heard about the new "sheet metal" engine Powel Crosley, Jr. was developing for his tiny postwar automobiles. The engine was a four cylinder development of a single overhead cam six invented by a Californian named Lloyd Taylor that the Navy evaluated for use in driving generators aboard World War II PT boats.

The engine's block consisted of 4 steel tubes for cylinders, sheet metal stampings for cylinder heads, intake and exhaust ports, valve enclosures, water jackets and many other components. In all, 120 or so stampings were utilized, each fitted to the other by crimping, press fits and/or spot welds. When it was all together, copper, in various forms (including paste), was applied to the joints and the block was placed in a furnace at 2060° and held there until everything melded into one. The copper brazed block was then fitted with a 7¾ pound aluminum crankcase just 3 inches deep, in which was cradled a cast steel, five main bearing crankshaft. The overhead cam was driven by a tower shaft and two bevel gears. Cylinders were protected by a baked on coating of plastic, which

inhibited rust. Pistons were of aluminum.

The bore was 2.5 inches, the stroke 2.25 inches and the displacement was only 44 cubic inches. That's only a smidgin more than the displacement of just **one** of the cylinders of a Continental A-65! The compression ratio was 8.2 to 1 and a mighty 26.5 horsepower was alleged to have been developed at 5000 rpm. It was a tiny thing — just over a foot long — and less generator and starter, weighed barely 59 pounds.

Mooney worked out a deal to buy engines from Crosley and set to work modifying one for his new airplane. It was fitted with a 2 to 1 belt reduction unit that utilized 4 Goodyear "wedge" belts, a new development at the time. The automotive ignition and plugs, generator, carb (Tillotson) and 1.8 quart cooling system were retained, the radiator located in a scoop fitted to the belly right under the pilot. As modified, the engine package weighed 101 pounds.

Mooney obtained CAA certification of the engine, which was designated the "Mooney CC46M-2", and proceeded to install it in the new airplane that had been under development during the same time frame. You know what it looked like — the first of the high aspect ratio winged Mooneys with the forward swept vertical tail. The mixed construction is also pretty well known: wood wing, tail cone and tail surfaces, all tied into a steel tube cage that formed the cockpit area. A tricycle, retractable landing gear was fitted, actuated mechanically by means of a long lever in the cockpit. Runway shocks loads were absorbed by rubber discs in compression, a Mooney trademark to this day.

Al's last design before the Mite had been the Culver V, which incorporated a patented interconnection between the pitch trim and the flaps, a system called Simpli-Fly ("Before You Buy, Try Simpli-Fly"). A version of it was used on the Mite. As they still do today on the 201 and 231, the Mite's entire tail section

Tony Terrigno



pivoted for pitch trim. A little hand crank on the left side of the cockpit tilted the tail forward (or "up") until during the last 1/4 of the crank's travel, it also began lowering the flaps. This simultaneous nose up/flaps down action cancelled out the trim change most other airplanes experience when the flaps are lowered or raised. If you had to make a go-around, a spring in the system permitted some "give" in the trim so that sudden application of throttle would not stand the airplane on its tail.

The M-18 was full of such clever devices. The gear-up warning was an old vacuum type windshield wiper motor mounted in the panel and running off the intake manifold which wagged a red disc right in front of the pilot's nose whenever power was reduced to about 1200 rpm — with the gear still up. Then there was the fuel shut-off valve, positioned so that if left "off", it would be nudged to "on" by application of full throttle.

Al had a million of 'em!

Specs included a span of 27 feet, a wing area of 95 square feet and an empty weight of just 460 pounds. At its 700 pound gross weight, the Mite had a wing loading of 7.4 pounds per square foot. Unfortunately its power loading was a rather sickly 28 pounds per horsepower (most lightplanes are in the 12 to 18 pound area) . . . and therein tells the tale of the Crosley engined Mooney Mite.

One of the best contemporary reports on the Crosley Mite was Max Karant's, which appeared in **Flying** in December of 1948. Max thought it flew beautifully . . . once he managed to get it off the ground. It took him over 15 seconds of ground roll — on pavement and into a 20 mph crosswind — to get it flying and then he was stuck with a climb rate of between 180 and 200 fpm. Max, who has never been known to mince his words, laid it on the line. The airplane was grossly underpowered, with "unsatisfactory take-off performance" — in another paragraph he called it "critical". It needed a higher horse-

power aircraft engine, he wrote, which would turn it into an "excellent little airplane".

Max also wasn't exactly overwhelmed with the manual gear retraction system . . . making him the first in a long and distinguished line of aviation writers to decry the infamous Mooney "muscle builder" and/or "thumb buster" gear handle that persisted down through the Mark 20 series before finally being replaced by an electric retraction system. Max thought the Crosley Mite's gear handle compromised safety during take-off because the pilot had to momentarily duck his head while reaching forward under the panel to grasp it. Many of Max's recommendations were subsequently incorporated in the Mite (including the name, it seems), but the "thumb buster" endured for another 20 years.

Regarding the name "Mite", it appears to have been coined by Max Karant in the first paragraph of his 1948 **Flying** article when he wrote, "The Mooney M-18 (I'd call it the Mite) is so tiny that you almost have to 'strap it on' to fly it." Apparently, the airplane had no name prior to that — just the designation M-18. Max's nickname stuck and in all subsequent articles, it is referred to as the "Mite".

With the Crosley engine, the Mite was not a very fast airplane — for the power it was, but not as compared to other lightplanes of the day. It cruised at 85 mph and topped out at 100. Redline was only 120 mph . . . and the structural load factor was 4.4 G. Economy was the Crosley Mite's long suit. It could be leaned down to around 1.5 gph — and several long distance flights were made on ridiculously small amounts of fuel, including a 1312 mile jaunt in 1950 by Al Mooney, himself, to celebrate his 25th year as an airplane designer.

A half dozen Crosley powered Mites were built and placed in the hands of dealers in California, Florida, Ohio, New York and, of course, Kansas to do a market survey before committing to full production. The answer was quick in coming . . . "It needs more power!" Consequently, Al gave up his goal of a truly low cost airplane and installed a Lycoming O-145.

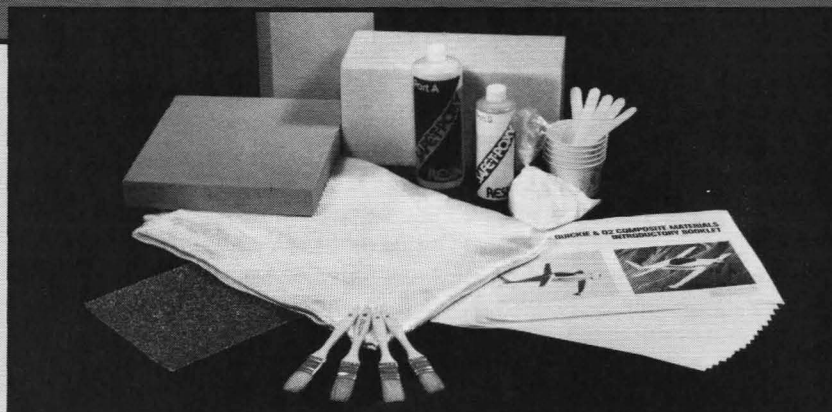
The results were spectacular. It had been belatedly discovered that though rated at 25 hp as a result of bench testing, most of the Crosleys — as installed in the airplanes — were actually producing only about 17 or 18 horsepower. With the 65 horsepower Lycoming, the little bird became a pocket rocket by comparison.

The numbers say it all:

	Crosley	Lycoming
Empty Weight	460 lbs.	500 lbs.
Gross	700 lbs.	780 lbs.
Wing Loading	7.4 lbs.	8.2 lbs.
Power Loading	28 lbs.	12 lbs.
Top Speed	100 mph	138 mph
Cruise	85 mph	115 mph
Climb Rate	400 fpm	1090 fpm
Absolute Ceiling	14,000 ft.	21,300 ft.

With this model, the M-18L, Al Mooney had himself an airplane and production was soon underway. Through the next seven years, a number of minor improvements were made, things like increasing the fuel capacity and enlarging the canopy, and, ultimately, producing a version with the Continental A-65. There were five model designations in all: the original Crosley powered M-18, the Lycoming O-145 M-18L and M-18LA, the A-

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65 powered M-18C and the last of the line, the M-18C-55. 291 Mooney Mites were built of which the M-18C was the most popular model with 120 delivered. The first 226 were built in Wichita and the remaining 65 were built in Kerrville, Texas after Mooney moved the company there in 1953. Al and his brother Art, who was his production ram rod, both resigned from Mooney Aircraft in 1955 and were never associated with the aircraft that bore their names again.

Al Mooney lives in retirement in Texas at this writing. He has been a brilliant and legendary aircraft designer throughout his long career . . . and usually well ahead of his time.

Our Featured Airplane

Our featured Mooney Mite is the 81st one built — a 1950 M-18L. It was totally and beautifully restored by its present owner, Tony Terrigno of Buena Park, CA. It is yellow with a dark green "feathered" trim stripe, outlined in black.

Bought in 1975 as a basket case, it was completely disassembled and rebuilt. Fortunately, most of the wood was in excellent shape and only required some minor rework in the tail cone and some reglueing of joints. All the old wiring, fuel lines, etc., were replaced; the cockpit was fully insulated and reupholstered; a later model 15 gallon fuel tank was installed; the gear was rebushed . . . you name it. The Lycoming O-145 was overhauled, all the cowling was replaced and the nose bowl was rebuilt with a landing light installed.

DuPont enamel was used to paint the airplane and is the only thing Tony says he would do differently the next time around (this is his second Mooney Mite restoration, incidentally). It looks great but is subject to minor cracking in the more flexible areas (fabric). He would use DuPont's acrylic enamel today, he says.

The Mite was flown in August of 1980 and has accumulated 200 hours since the restoration. A shelf full of trophies have been won, including Best Custom Class A (0-80 hp) at Oshkosh last summer . . . and was still raking them in at the Copperstate Fly-In last October when we saw him there.

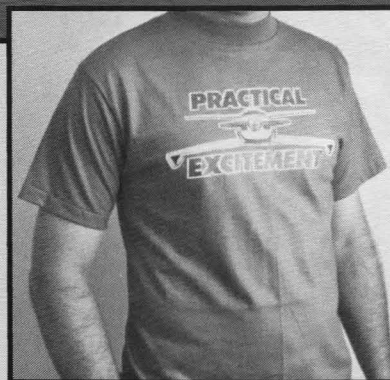
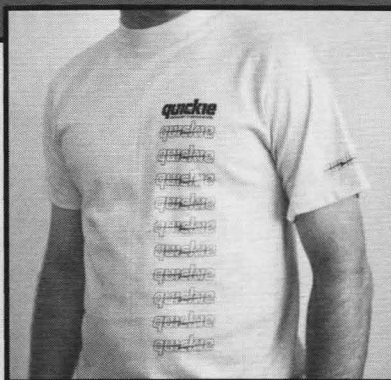
A native of Youngstown, OH, Tony moved to California in 1954 to go to work as an engineer for Hughes Aircraft. Today, he travels the world for Hughes as a Technical Director of defense system installations. He began flying — on his own — in 1942 and has been at it ever since. Over the years, he has owned a Porterfield, PT-19, Cessna 140 (2 of them), a 172 and has flown many other types, including Stinson SR-9s and 10s, BT-13s and golden oldies like Waco 10s.

Concurrent with his powerplane flying, Tony has been equally involved with soaring. He has been a soaring instructor for the Orange County Soaring Association for 18 years and currently owns a PIK-20D.

Of his Mite, he says, "It's a fun machine, but has its limitations — you have to know them. It's clean and you have to watch your speed in turbulence — especially during fly-bys. Otherwise, it's a nice airplane to own today — a very economical airplane." On his trip to Oshkosh last summer, he had an average ground speed of 118 mph, burning 3.3 gallons per hour.

And I can certainly vouch for the fact that it's a show stopper at fly-ins! ☺

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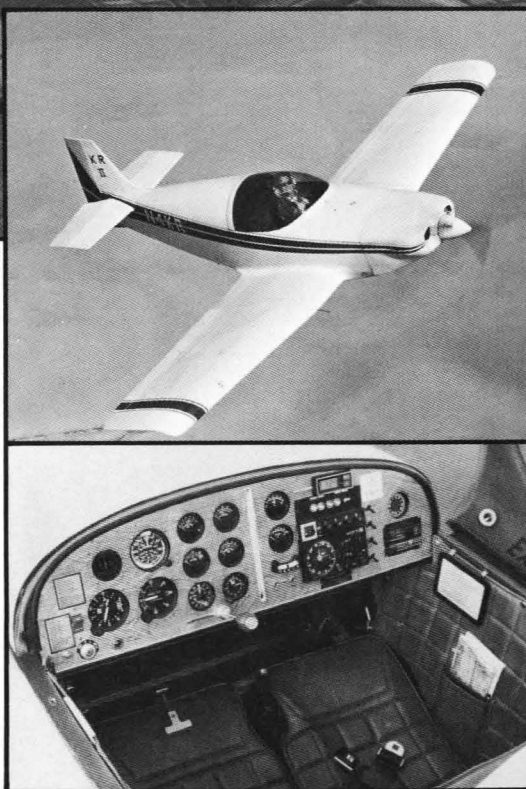
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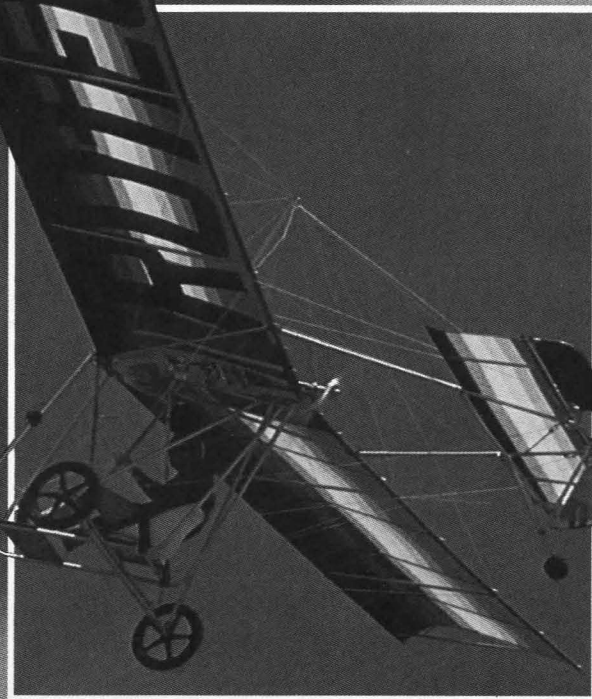
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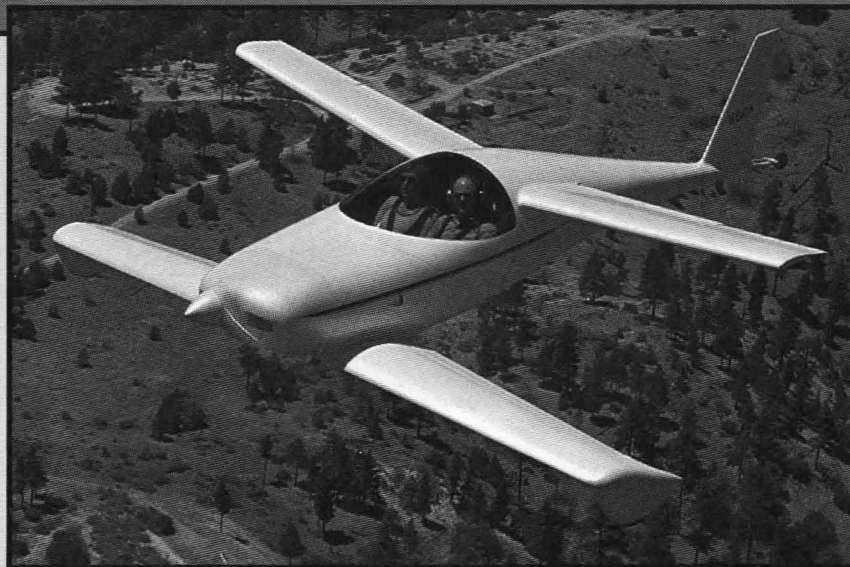
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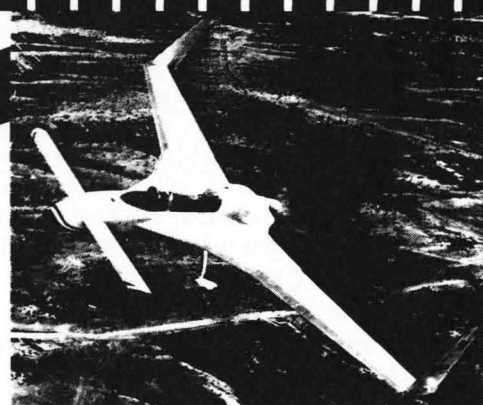
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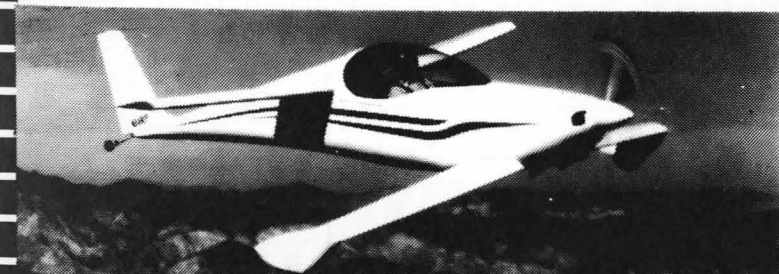
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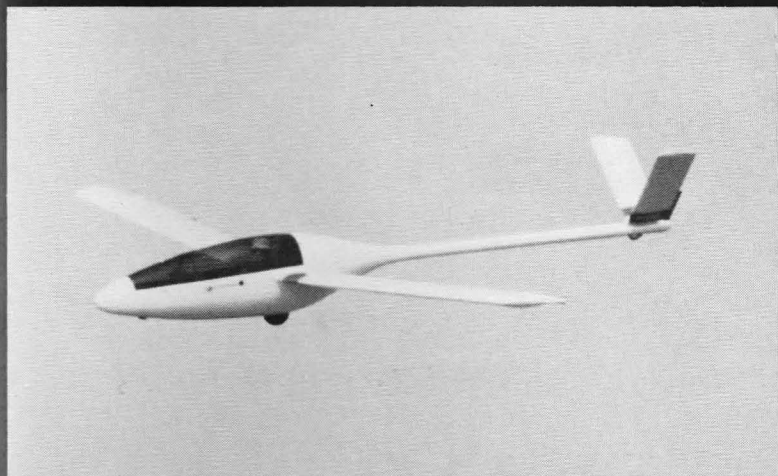
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